Toshiba Personal Computer

Satellite T130D/Satellite ProT130D/PORTEGE T130D

Maintenance Manual

TOSHIBA CORPORATION

File Number 960-Q08

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Toshiba Personal Computer Satellite T130D,Satellite Pro T130D,PORTEGE T130DMaintenance Manual

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Disclaimer

The information presented in this manual has been reviewed and validated for accuracy. The included set of instructions and descriptions are accurate for the Satellite T130D, Satellite Pro T130D, and PORTEGE T130D Series at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Therefore, Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions, or discrepancies between any succeeding product and this manual.

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite T130D, Satellite Pro T130D, and PORTEGE T130D Series.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

> ***DANGER:*** *"Danger" indicates the existence of a hazard that could result in death or serious bodily injury, if the safety instruction is not observed.*

> ***WARNING:*** *"Warning" indicates the existence of a hazard that could result in bodily injury, if the safety instruction is not observed.*

> ***CAUTION:*** *"Caution" indicates the existence of a hazard that could result in property damage, if the safety instruction is not observed.*

> ***NOTE:*** *"Note" contains general information that relates to your safe maintenance service.*

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- ❑ Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- ❑ If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

Chapter 1	Hardware Overview describes the Satellite T130D, Satellite Pro T130D, and PORTEGE T130D system unit and each FRU.
Chapter 2	Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
Chapter 3	Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
Chapter 4	Replacement Procedures describes the removal and replacement of the FRUs.
Appendices	The appendices describe the following:

- ❑ Handling the LCD Module
- ❑ Board layout
- ❑ Pin assignments
- ❑ Keyboard scan/character code
- ❑ Key layout
- ❑ Wiring diagrams

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Acronyms

On the first appearance and whenever necessary for clarification acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

Keys

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

Key operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

User input

Text that you are instructed to type in is shown in the boldface type below:

DISKCOPY A: B:

The display

Text generated by the computer that appears on its display is presented in the typeface below:

Format complete
System transferred

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Chapter 3 Diagnostic Programs

Chapter 4 Replacement Procedures

Appendices

Chapter 1

Hardware Overview

Chapter 1 Contents

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Tables

Features

1.1 Features

The Satellite T130D, Satellite T130D, PORTEGE T130D (AMD Platform) features are listed below.

Microprocessor

Microprocessor that is used will be different by the model.

It supports processors as follows

-1.6GHz (18W), Turion X2 Neo Dual-Core Processor L625

-1.5GHz (18W), Athlon X2 Neo Dual-Core Processor L325

-1.6GHz (15W), Athlon Neo MV-40

Memory

Two DDR2 SO-DIMM (DDR2-667 or compatible) used and be up to 8GB which can be upgraded through Memory Module Slot. Maximum upgradeable system memory may depend on the model

VRAM

Shared with System RAM for AMD RS780MN。

HDD

5400rpm: 250GB, 320GB, 400GB, 500GB, internal drives. 2.5 inch x 9.5mm height.

Display

LCD

13.3-inch, 1366x768(16:9), LED-backlight.

External monitor

Supported via a RGB connector.

Keyboard

Keyboard module has 85 or 86 keys. It supports Windows key and Application key.

Battery

The RTC battery is equipped inside the computer.

The main battery is a detachable lithium ion battery.

-6 cell 10.8V

-12cell 10.8V

USB (Universal Serial Bus)

3 USB ports are provided. The ports comply with the USB2.0 standard. USB Sleep and Charge function can be supported by only one port of the left side. (mode 1, 3, 4).If USB Sleep and Charge function is enabled, the computer's battery will discharge during hibernation or when the computer is turned off. It is recommended that user connect the AC adaptor to the computer when enabling the USB Sleep and Charge function.

Sound system

Internal stereo speaker, Internal MIC (Option) external monaural microphone connector, stereo headphone connector.

Wireless LAN

Some computers in this series are equipped with a Wireless LAN card.

LAN

The computer has built-in support for Ethernet LAN (10 megabits per second, 10BASE-T) and Fast Ethernet LAN (100 megabits per second, 100 BASE-TX).

Bridge Media Slot

SD/SDHC/MS/MS pro/xD/MMC are supported.

Bluetooth

Some computers in this series offer Bluetooth wireless communication functionality. This module is Version 2.1+EDR.

Wireless WAN

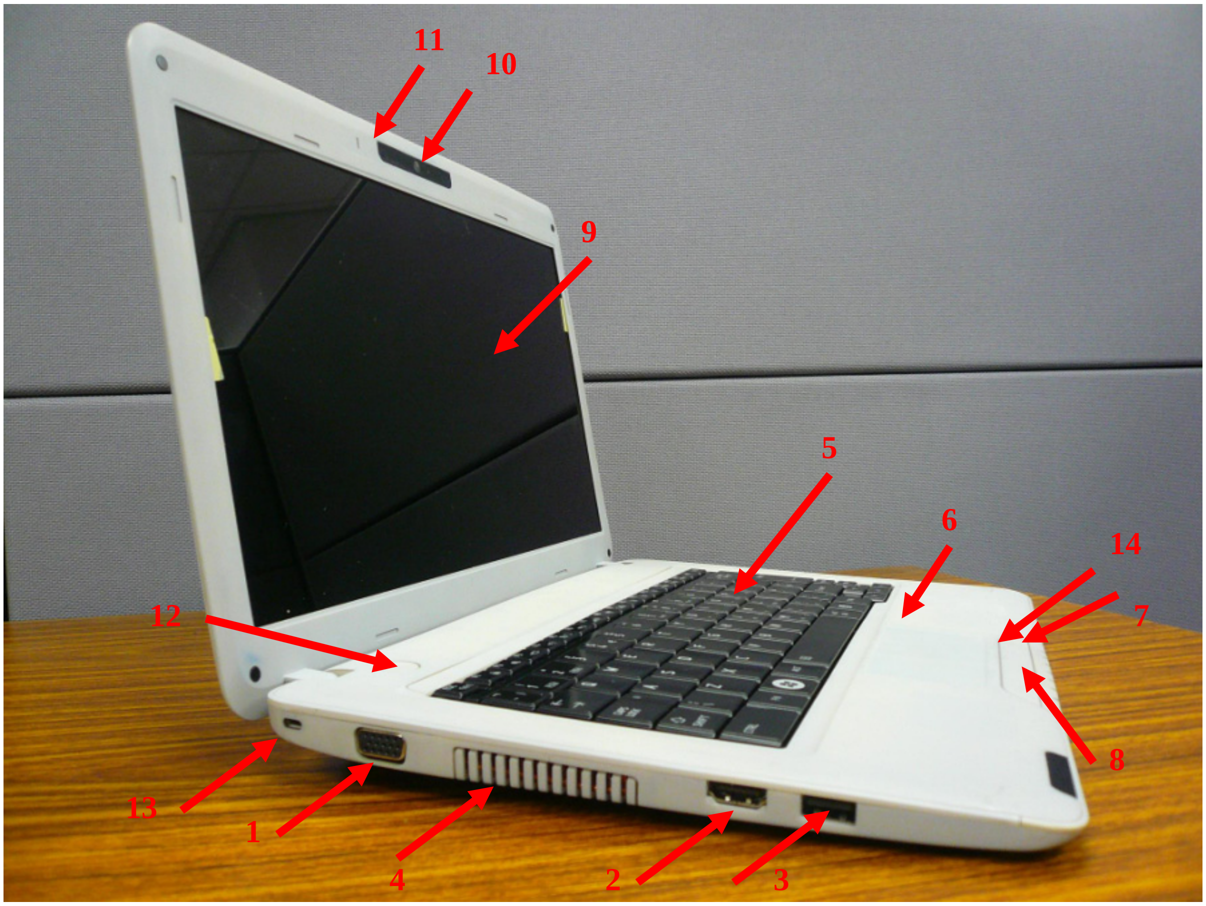
Some models are equipped with a Wireless WAN module.

Security

Kensington Lock,

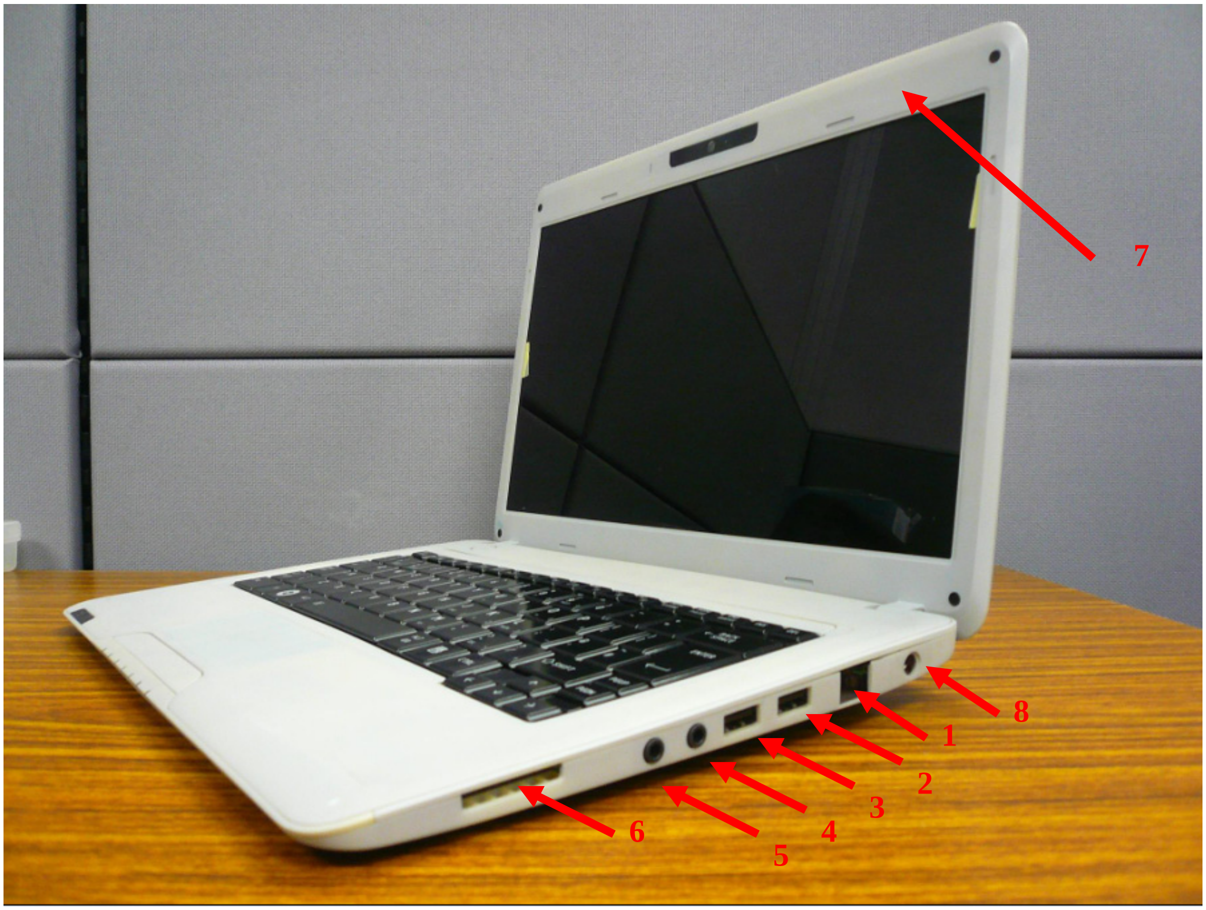
Hard Disk Drive Password

3D Accelerometer for Hard Disk Drive



1. External Monitor port
2. HDMI out port
3. USB port (USB Sleep and Charge function is supported by this port only.)
4. FAN HOLE
5. Keyboard
6. Touch Pad
7. Touch Pad Control Right Button
8. Touch Pad Control Light Button
9. Display Screen
10. Web Camera
11. Microphone
12.Power Button
13. Security Lock
14.Hall-sensor

Figure 1-1-1 left of the computer



1. LAN jack
2. USB port
3. USB port
4. Microphone jack
5. Headphone Jack
6. Bridge Media Slot
7. Wireless LAN/Wireless WAN Antennas
8. DC-IN jack

Figure 1-1-2 right of the computer

1.2 System Block Diagram

Figure 1-2-1 shows the system block diagram.

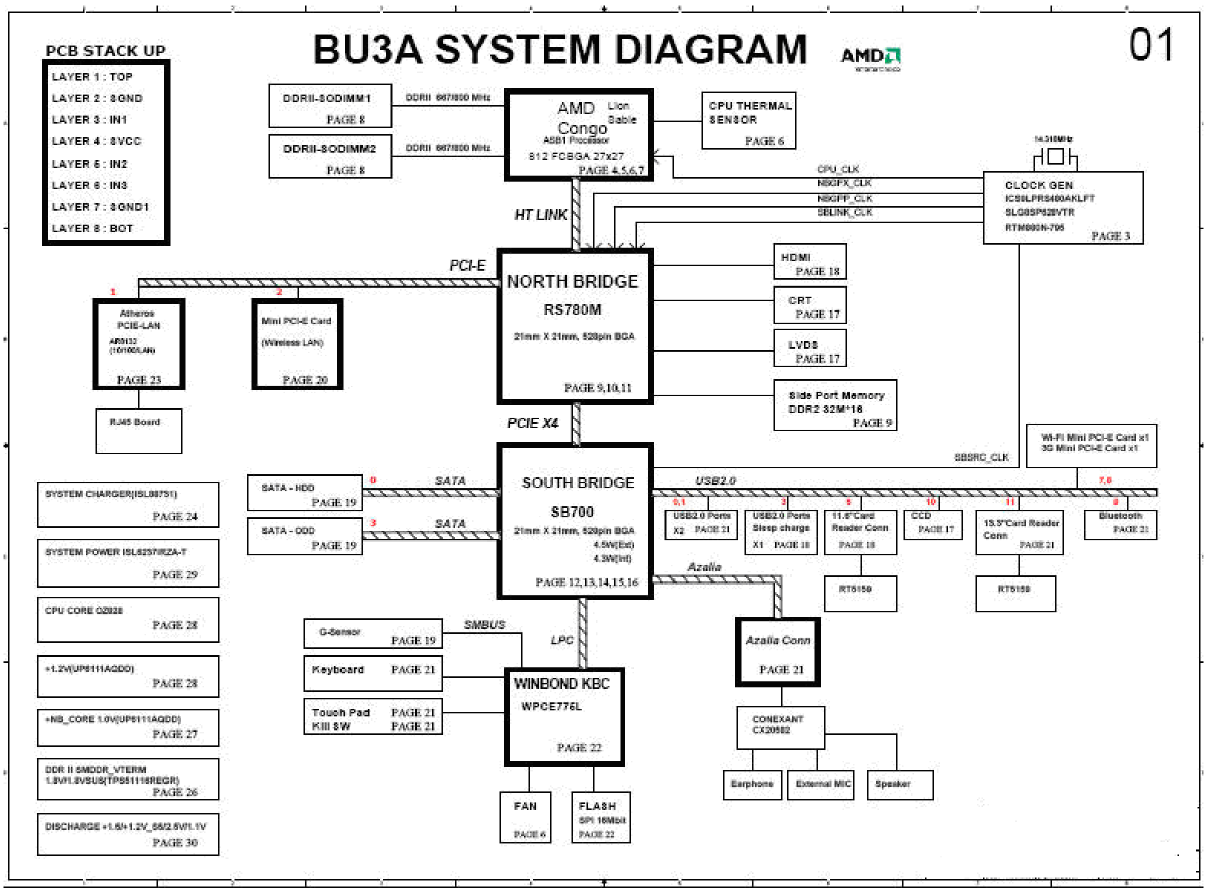


Figure 1-1-1 System block diagram for AMD Platform

The PC contains the following components.

CPU

-1.6GHz (18W), Turion X2 Neo Dual-Core Processor L625

-1.5GHz (18W), Athlon X2 Neo Dual-Core Processor L325

-1.6GHz (15W), Athlon Neo MV-40

Memory

Two memory slots capable of accepting DDR2-SDRAM 1GB, 2GB or 4GB memory modules for a maximum of 8GB.

- 200-pin SO-DIMM
- 1.8V operation

BIOS ROM (Flash memory)

- 16Mbit

Chipset

- North Bridge (AMD RS780MN, Support HDMI)
  - Supports an optional dedicated local frame buffer (side-port) of up to 128MB through a 16-bit interface.
  - Supports ATI HyperMemory*
  - Supports PCI-E Gen2 (version 2.0)
  - 528-FCBGA package, 21mmx21mm.

- South Bridge (AMD SB710)
  - PCI Host Bus Controller
  - USB Controllers
  - SMBus Controller
  - Interrupt Controller
  - DMA Controller
  - LPC Host Bus Controller
  - SATA Controller
  - Legacy IDE Emulation Support

- – AMD RAID Support
- – AHCI Support
- – IDE Controller
- – RTC (Real Time Clock)
- – Power Management
- – Integrated Micro-Controller (IMC)*
- – High Definition Audio Controller
- – 21mm x 21mm,0.8mm Pitch 528-FCBGA Package

Other main system chips

- Clock Generator (Congo Platform: SLG8SP628VTR)

EC–[WO/CIR WPCE775CA0DG)] –

HD Audio (CONEXANT CX20583-10Z)

Card Reader controller (REALTEAK RTS5159)

10/100 LAN controller (Atheros AR8132M)

Mini Card

Wireless LAN (BTO)

IEEE802.11b/g or IEEE802.11b/g/n

Wireless WAN (BTO)

HSPA

Blue tooth

Bluetooth V2.1+EDR. (BTO)

1.3 2.5-inch Hard Disk Drive

A compact, high-capacity HDD with a height of 9.5mm. Contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-3-1 shows a view of the 2.5-inch HDD and Tables 1-3-2 and 1-3-3 list the specifications.

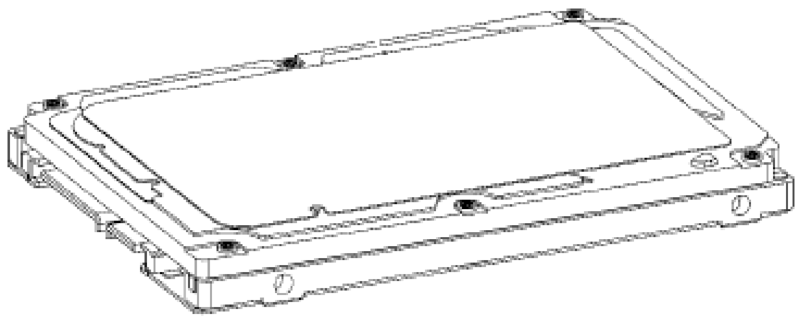


Figure 1-3-1 2.5-inch HDD

Parameter		Standard value			
		Toshiba MK2555GSX	**Toshiba MK3255GSX**	**Toshiba MK4055GSX**	**Toshiba MK5055GSX**
Outline dimensions	Width (mm)	69.85 +/- 0.25			
	Height (mm)	9.5			
	Depth (mm)	100.2 +/- 0.25			
	Weight (g)	97/98	97/98	101//102	101//102

Parameter		Standard value			
		Hitachi HTS545025B9A300	**Hitachi HTS545032B9A300**	**Hitachi HTS545040B9A300**	**Hitachi HTS545050B9A300**
Outline dimensions	Width (mm)	100			
	Height (mm)	9.5			
	Depth (mm)	70			

	Weight (g)	95 (max.)	95 (max.)	102 (max.)	102 (max.)

Parameter		**Standard value**	
		WD WD2500BEVT-26ZCT0	**WD WD3200BEVT-26ZCT0**
Outline dimensions	Width (mm)	100	
	Height (mm)	12.5	
	Depth (mm)	70.0	
	Weight (g)	101(Max)	

Table 1-3-2 2.5-inch HDD dimensions

	Specification			
Parameter	**Toshiba MK2555GSX**	**Toshiba MK3255GSX**	**Toshiba MK4055GSX**	**Toshiba MK5055GSX**
Storage size (formatted)	250GB	320GB	400GB	500 GB
Speed (RPM)	5,400			
Data transfer Rate - To/From Media - T0/From Host	363~952 typical 3GBytes			
bus transfer rate (MB/s)	3Gbps			
Average random seek time (read) (ms)	12			
Power-on-to-ready (sec)	3.5(typ)/9.5(Max)			

Specification				
Parameter	**Hitachi HTS545025B9A300**	**Hitachi HTS545032B9A300**	**Hitachi HTS545040B9A300**	**Hitachi HTS545050B9A300**
Storage size (formatted)	250GB	320GB	400GB	500GB
Speed (RPM)	5,400			
Data transfer Rate - To/From Media - T0/From Host	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps	65.5MB/s 1.5Gbps
bus transfer rate (MB/s)	150 (MB/s)			
Average random seek time (read) (ms)	11			
Power-on-to-ready (sec)	3.5 sec			

Specification		
Parameter	**WD WD2500BEVT-26ZCT0**	**WD WD3200BEVT-26ZCT0**
Storage size (formatted)	250GB	320GB
Speed (RPM)	5,400	
Data transfer Rate - To/From Media - T0/From Host	117MB/s Max. 3Gbps	
bus transfer rate (MB/s)	3Gbps	
Average random seek time (read) (ms)	12.0ms/14.0ms	
Power-on-to-ready (sec)	4.0 (typ)	

Table 1-3-3 2.5-inch HDD specifications

1.4 Keyboard

The Flatiron 10A keyboard has two different kinds of placement, one is for US style and the other is for UK style.

Figure 1-4-1 is a view of the keyboard for US style

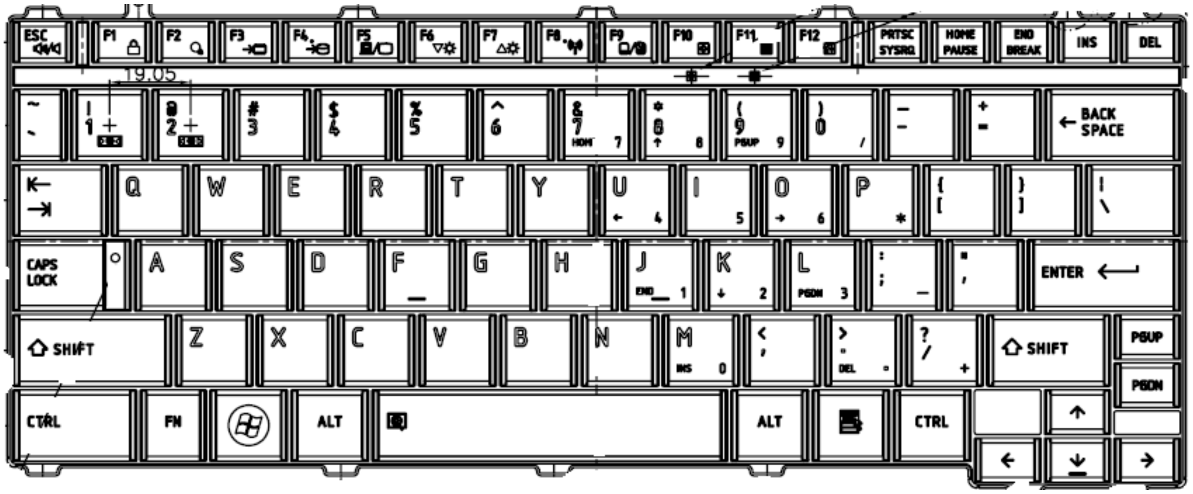


Figure 1-4-1 Keyboard for US style

Figure 1-4-2 is a view of the keyboard for UK style

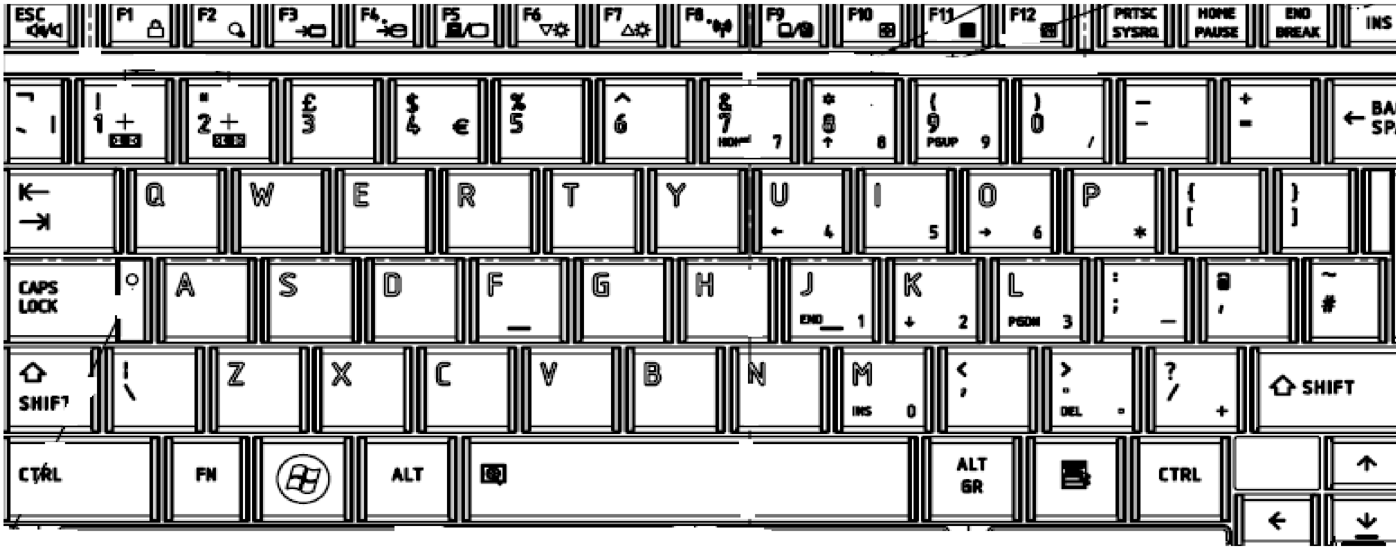


Figure 1-4-2 Keyboard for UK style

See Appendix E for details of the keyboard layout

1.5 TFT Color Display

The Satellite T130D, Satellite T130D, PORTEGE T130D use LED to control backlight.

1.5.1 LCD Function Block

Figure 1-5-1 shows a view of the LCD Function Block and Table 1-5-2 lists the specifications.

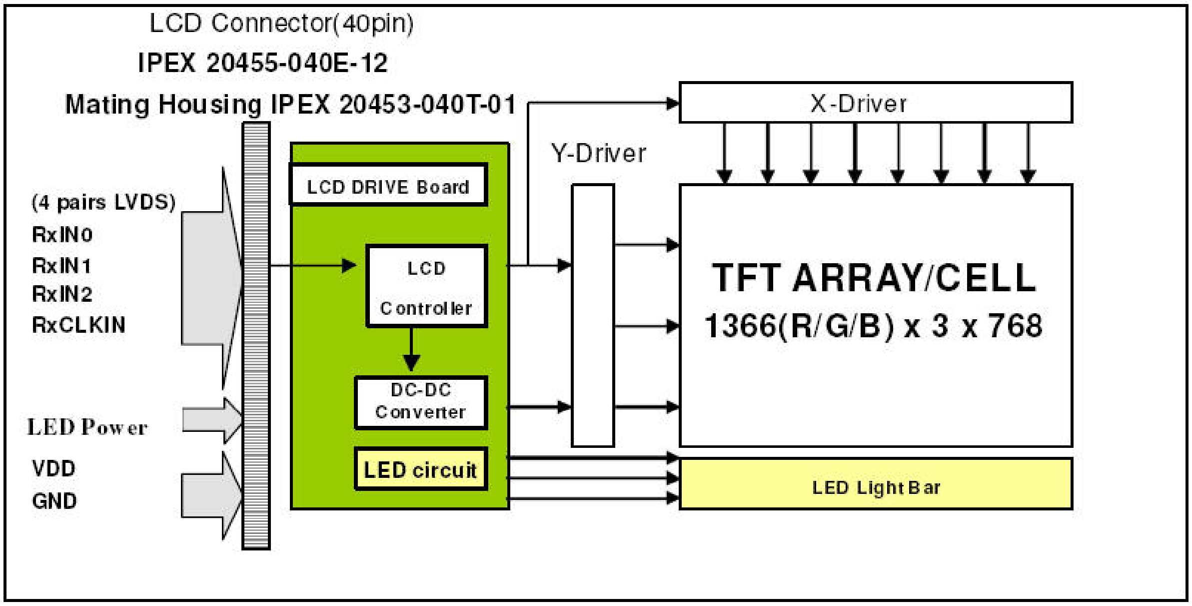
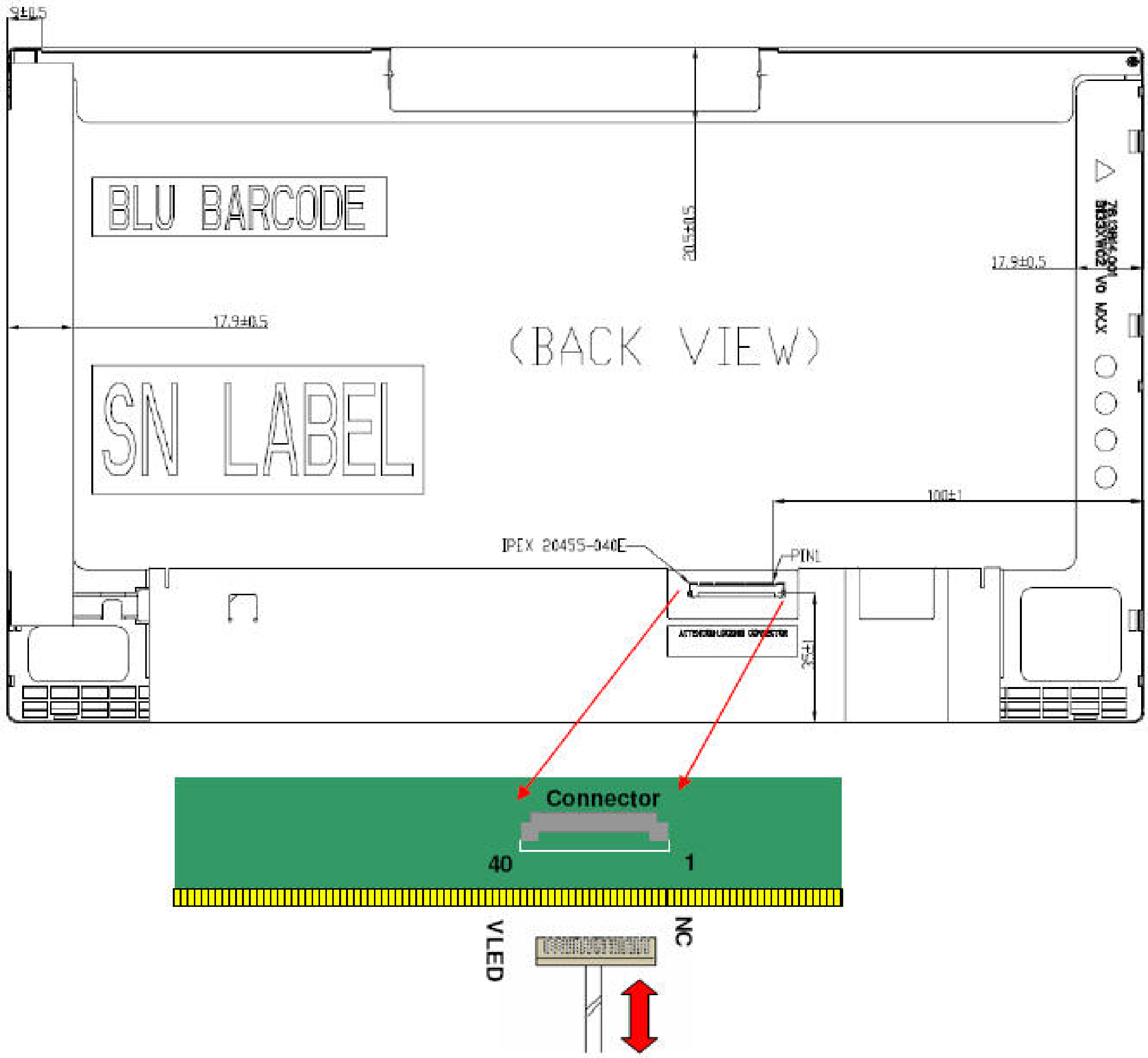


Figure 1-5-1 AUO LCD Function Block Diagram

Item	Specifications(WXGA+)		
	AUO B133XW02 V0(H/W:0A)	**LG LP133WH1 TLA1**	**TMD LT133EE10000**
Number of Dots	1366x3(RGB) x 768	1366x3(RGB) x 768	1366x3(RGB) x 768
Dot spacing (mm)	0.2148(H)X0.2148(V)	0.2148(H)X0.2148(V)	0.2148(H)X0.2148(V)
Display Colors	6-bit, 262,144 colors	6-bit, 262,144 colors	6-bit, 262,144 colors

Table 1-5-2 LCD module specifications

1.5.2 LCD Module



1.6 Power Rails

Table 1-6-1 lists the power rail output specifications of Congo platform.

Name	Power supply （Yes/No）			
	Voltage [V]	Power OFF Suspend mode	Power OFF Boot mode	No Main Battery(with RTC battery)
+5VPCU	5	Yes	Yes	No
+5V	5	No	No	No
+3VPCU	3.3	Yes	Yes	No
+3V_S5	3.3	Yes	No	No
+3VSUS	3.3	Yes	No	No
+3V	3.3	No	No	No
+1.8VSUS	1.8	Yes	No	No
+SMDDR_VTERM	1.8	Yes	No	No
+SMDDR_VREF	1.8	Yes	No	No
+1.8V	1.8	No	No	No
+1.5V	1.5	No	No	No
+1.2V	1.25	No	No	No
+1.05v	1.05	No	No	No
+NB_CORE	1.0~1.2	No	No	No
VCC_CORE	0.7~1.2	No	No	No
+VCCRTC	3.266	Yes	Yes	Yes

Table 1-6-1 Congo Power supply output rating

1.7 Batteries

The PC has the following two batteries.

Main battery
Real time clock (RTC) battery

Table 1-7-1 lists the specifications for these two batteries.

Battery Name		Battery Element	Output Voltage
Main Battery	6 Cell	Li-ion	10.8v
	12Cell	Li-ion	10.8 v
RTC Battery	Coin type	Li-ion	3.0v

Table 1-7-1 Battery specifications

1.7.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected.

1.7.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adaptor and battery are connected to the computer.

Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-7-2.

	Power ON	Power OFF
6 cell	5 ~ 10 hours	about 5 hours
12 cell	5 ~ 10 hours	about 4 hours

Table 1-7-2 Time required for charges of main battery

Charge is stopped in the following cases.

1. The main battery is fully charged
2. The main battery is removed
3. Main battery or AC adapter voltage is abnormal
4. Charging current is abnormal

Data retaining time

When turning off the power in being charged fully, the retaining time is as following Table 1-7-3.

Retaining data Time with power off (days) (when USB Sleep and Charge function is Disabled.)

Sleep	Shut down
About 3 days	About 30 days
About 5 days	About 50 days

Table 1-7-3 Data retaining time

* If USB Seep and Charge function is enabled, the computer’s battery will discharge during hibernation or when the computer is turned off.

1.7.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory.

Table 1-7-4 lists the Time required for charges of RTC battery and data retaining time.

Condition	Time
Charging time	About 24 hours
Data retaining time	About 30days

Table 1-7-4 Time required for charges of RTC battery

1.8 AC Adapter

The AC adapter is used to charge the battery.

Table 1-8-1 lists the AC adapter specifications.

Parameter	**Specification**	
With Led	**DELTA/ LITE-ON**	**DELTA/ LITE-ON**
Power	65W	65W
Input voltage	AC 100V/240V	
Input frequency	50Hz/60Hz	
Input current	≦ 1.5A	
Output voltage	DC 19V	
Output current	3.42A	3.42A

Table 1-8-1 AC adapter specifications

Chapter 2

Troubleshooting Procedures

Chapter 2 Contents

2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction.

The FRUs covered are:

1. Power supply
2. System Board
3. SATA HDD
4. Keyboard
5. Touch pad
6. Display
7. LAN
8. Wireless LAN
9. Sound
10. Bluetooth
11. HDMI
12. Memory
13. 3G
14. Camera
15. Microphone
16. Ext CRT
17. USB Board
18 LED

The Test Program operations are described in Chapter 3. Detailed replacement procedures are described in Chapter 4.

> ***NOTE:*** *After replacing the system board or CPU, it is necessary to execute the subtest 01 initial configuration of the 3.3 setting of the hardware configuration in Chapter 3.*

The implement for the Diagnostics procedures is referred to Chapter 3. Also, following implements are necessary:

1. Phillips screwdrivers (For replacement procedures)
2. Implements for debugging port check
    - Toshiba Free-DOS system FD

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-2-1 as a guide for determining which troubleshooting procedures to execute. Before going through the flowchart steps, verify the following:

- ❑ Ask him or her to enter the password if a password is registered.
- ❑ Verify with the customer that Toshiba Windows is installed on the hard disk. Non-Windows operating systems can cause the computer to malfunction.
- ❑ Make sure all optional equipment is removed from the computer.

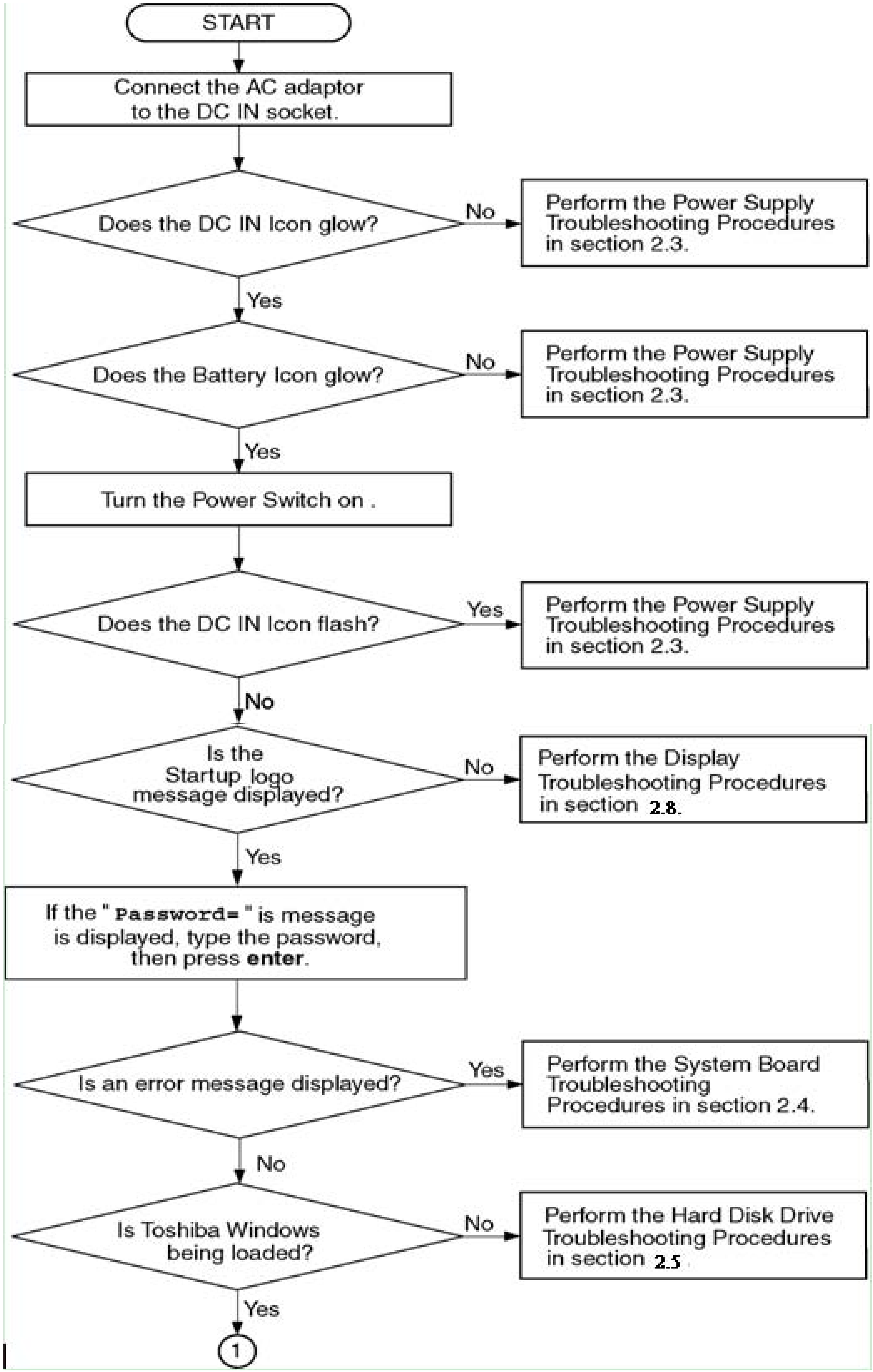


Figure 2-2-1 Troubleshooting flowchart (1/2)

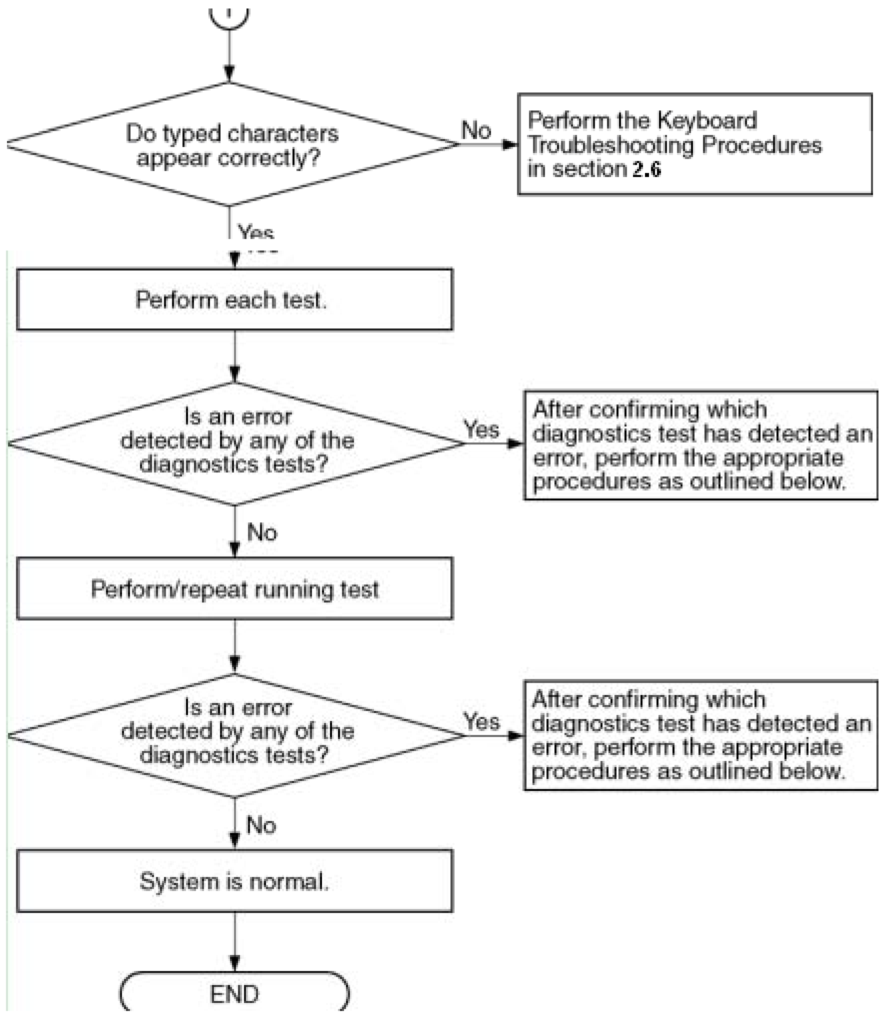


Figure 2-2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The Test program should be executed several times to isolate the problem. Check the Log Utilities function to confirm which diagnostic test detected an error(s), and then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the system test, memory test, display test, expansion test, real timer test, sound test or LAN/Bluetooth test, perform the System Board Troubleshooting Procedures in Section 2.4.

2. If an error is detected on the hard disk test, perform the HDD Troubleshooting Procedures in Section 2.5.

3. If an error is found on the keyboard test (DIAGNOSTICS TEST) and pressed key display test, perform the Keyboard Troubleshooting Procedures in Section 2.6.

4. If an error is found on the touch pad test, perform the Touch pad Troubleshooting Procedures in Section 2.7.

5. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.8.

6. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.9.

7. If an error is detected on the Wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.10.

8. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.11.

9. If an error is detected on the Bluetooth test, perform the Bluetooth Troubleshooting Procedures in Section 2.12.

10. If an error is detected on the HDMI test, perform the HDMI Troubleshooting Procedures in Section 2.13

2.3 Power Supply Troubleshooting

The power supply controller controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

Procedure 1: Power Status Check

Procedure 2: Connection Check

Procedure 3: Charging Check

Procedure 4: Replacement Check

Procedure 1 Power Status Check

The following LED indicates the power supply status:

- Battery LED
- DC IN LED

The Power Supply control displays the power supply status with the Battery LED and the DC IN LED as listed in the tables below.

Battery icon	Power supply status
Lights orange	Battery is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights blue	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low while the system power is ON.
Blinks orange once (at being switched on)	The system is driven by only a battery and the battery level is low.
Doesn’t light	Any condition other than those above.

Table 2-3-1 Battery icon

DC IN icon	Power supply status
Lights blue	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction*1
Doesn't light	Any condition other than those above.

Table 2-3-2 DC IN icon

*1 When the power supply controller detects a malfunction, the DC IN icon blinks orange and perform the following procedure.

When the icon is blinking, perform the following procedure.

1. Remove the battery pack and the AC adapter.
2. Re-attach the battery pack and the AC adapter.

If the icon is still blinking after the operation above, check the followings:

Check 1 If the DC IN icon blinks orange, go to Procedure 2.

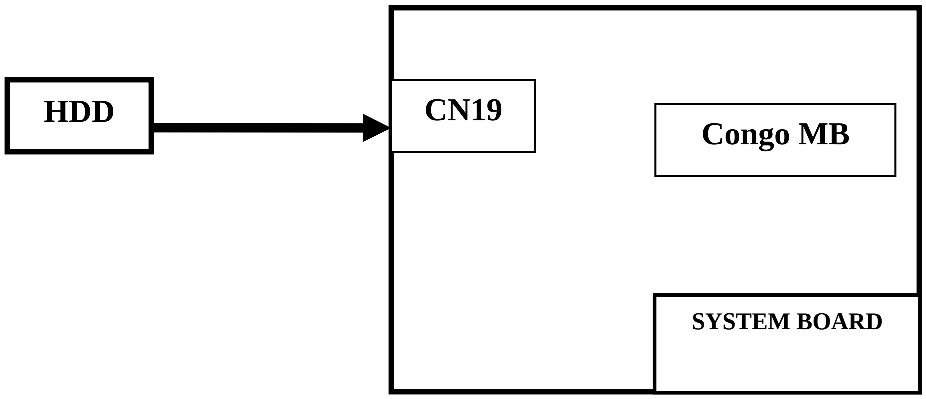
Check 2 If the DC IN icon does not light, go to Procedure 3.

Check 3 If the battery icon does not light orange or green, go to Procedure 4.

***NOTE**: Use a supplied AC adapter.*

Procedure 2 Connection Check

The wiring diagram related to the power supply is shown below:



Any of the connectors may be disconnected. Perform Check 1.

Check 1 Make sure the AC adapter and the AC power cord is firmly plugged into the DC IN connector PCN1 (Congo) and wall outlet. If these cables are connected firmly, go to Check 2.

Check 2 Replace the AC adapter and the AC power cord with new ones.

- If the DC IN icon does not light, go to Procedure 4.
- If the battery icon does not light, go to Check 3.

Check 3 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 3 Charging Check

Check if the power supply controller charges the battery pack properly. Perform the following procedures:

Check 1 Make sure the AC adapter is firmly plugged into the DC IN socket.

Check 2 Make sure the battery pack is properly installed. If it is properly installed, go to Check 3.

Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack while connecting the battery pack and the AC adapter. If the battery pack is still not charged, go to Check 4.

Check 4 The battery's temperature is too high or low. Leave the battery for a while to adjust it in the right temperature. If the battery pack is still not charged, go to Check 5.

Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 4.

Procedure 4 Replacement Check

The power is supplied to the system board by the AC adapter. If either the AC adapter or the system board was damaged, perform the following Checks.

To disassemble the computer, follow the steps described in Chapter 4, *Replacement Procedures*.

When AC adapter is connected;

Check 1 AC adapter may be faulty. Replace the AC adapter with a new one. If the problem still occurs, perform Check 2.

Check 2 System board may be faulty. Replace the system board with a new one.

When AC adapter is not connected ;
(When driving with battery pack)

Check 1 Battery pack may be faulty. Replace it with a new one. If the problem still occurs, perform Check 2.

Check 2 System board may be faulty. Replace it with a new one.

2.4 System Board Troubleshooting

This section describes how to determine if the system board is malfunctioning or not. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1: Message Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Replacement Check

Procedure 1 Message Check

When the power is turned on, the system performs the Power on Self Test (POST) installed in the BIOS ROM. The POST tests each IC on the system board and initializes it.

- If an error message is shown on the display, perform Check 1.
- If there is no error message, go to Procedure 2.
- If Free-DOS or Windows XP is properly loaded, go to Procedure 4.

Check 1 If one of the following error messages is displayed on the screen, press the **F2** key as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS type memory) is not the same as the actual configuration or when the data is lost.

If you press the **F2** key as the message instructs, the SETUP screen appears to set the system configuration.

Procedure 2 Diagnostic Test Program Execution Check

Execute the following tests from the Diagnostic Test Menu. These tests check the system board. Refer to Chapter 3, *Tests and Diagnostic,* for more information on how to perform these tests.

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Hard Disk test
6. CPU Temperature test
7. Main Battery test
8. BIOS test
9. System Status LED test
10. Wireless LAN test
11. LAN/Sound test
12. UUID test-DMI Information (Write DMI)

If an error is detected during these tests, go to Procedure 4.

Procedure 3 Replacement Check

System board may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and replace system board with a new one.

2.5 SATA Hard Disk Drive Troubleshooting

To check if 2.5" HDD is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

> ***CAUTION**: The contents of the hard disk will be erased when the 2.5" HDD troubleshooting procedures are executed. Transfer the contents of the hard disk to floppy disks or other storage drive(s). For the backup, refer to the User's Manual.*

Procedure 1 Partition Check

Insert the Toshiba Free-DOS system disk and start the computer. Perform the following checks:

Check 1 Input **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.

Check 2 Input **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still occurs, go to Procedure 2.

Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.

Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still occurs, go to Procedure 2. Otherwise, the 2.5" HDD is operating normally.

Procedure 2 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. When the test detects an error, an error message is displayed on the screen.

Make sure no floppy disk is in the FDD. Turn on the computer and check the message on the screen. When an OS starts from the 2.5” HDD, go to Procedure 3. Otherwise, start with Check 1 below and perform the other checks as instructed.

Check 1 If either of the following messages appears, go to Check 2. If the following messages do not appear, perform Check 3.

```
Insert system disk in drive
Press any key when ready .....
```

or

```
Non-System disk or disk error
Replace and press any key when ready
```

Check 2 Using the SYS command of the Free-DOS, transfer the system to the 2.5” HDD. If the system is not transferred, go to Procedure 3. Refer to the Free-DOS Manual for detailed operation.

If the following message appears on the display, the system program has been transferred to the HDD.

```
System Transferred
```

If an error message appears on the display, perform Check 3.

Check 3 2.5” HDD(s) and the connector(s) of system board may be defective (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling.). Insert HDD(s) to the connector(s) firmly. If it is (or they are) firmly connected, go to Procedure 3.

Procedure 3 Format Check

The computer’s HDD is formatted using the Free-DOS FORMAT program or the physical format program of the test program. To format the HDD, start with Check 1 below and perform the other steps as required.

Refer to the Free-DOS Manual for the operation of Free-DOS. For the format by the test program, refer to the Chapter 3.

Check 1 Format an 2.5” HDD using Free-DOS FORMAT command. Type as **FORMAT C:/S/U**.

If 2.5” HDD can not be formatted, perform Check 2.

Check 2 Using the Free-DOS FDISK command, set the 2.5” HDD partition. If the partition is not set, go to Check 3. If it is set, format 2.5” HDD using Free-DOS FORMAT command.

Check 3 Using the Diagnostic Disk, format 2.5” HDD with a format option (physical format). If HDD is formatted, set the 2.5” HDD partition using Free-DOS FDISK command.

If you cannot format 2.5” HDD using the Tests and Diagnostic program, go to Procedure 4.

Procedure 4 Diagnostic Test Program Execution Check

The HDD test program is stored in the Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed. The error codes and statuses are described in Table 2-5-1. If an error code is not displayed but the problem still occurs, go to Procedure 5.

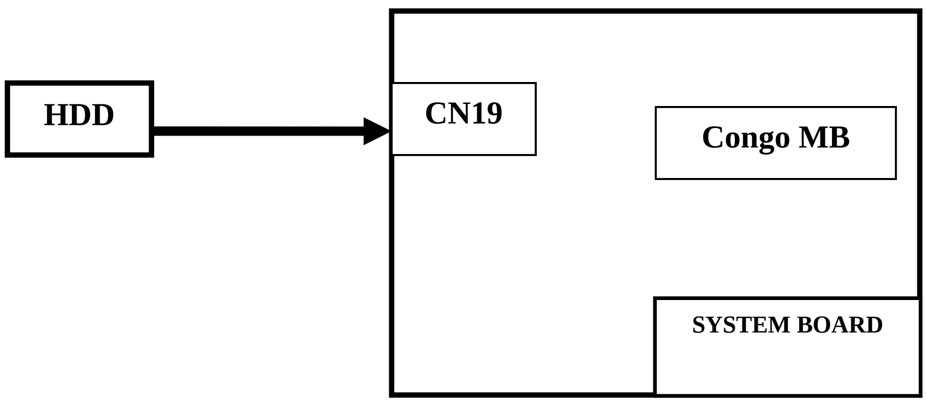
Code	Status
01	Bad Command Error
02	Bad Address Mark Error
04	Record Not Found
05	HDC Not Reset Error
07	Drive Not Initialized
09	DMA Boundary Error
0A	Bad Sector
0B	Bad Track Error
10	ECC Error
11	ECC Recover Enabled
20	HDC Error
40	Seek Error
80	Time Out Error
AA	Drive Not Ready
BB	Undefined Error
CC	Write Fault
E0	Status Error
F0	No Sense Error
??	Other Error

Table 2-5-1 HDD error code & status

Procedure 5 Connector Check and Replacement Check

HDD(s) is/are connected to the connector(s) on the system board. The connection of HDD(s) and board may be defective. Otherwise, they may be faulty. Disassemble the computer following instructions in Chapter 4, *Replacement Procedures* and perform the following checks.

Check 1 Make sure HDD(s) is/are firmly connected to the connector(s) on the system board.



If any of the connections are loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 (One of) HDD(s) may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.6 Keyboard Troubleshooting

To check if the computer's keyboard is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

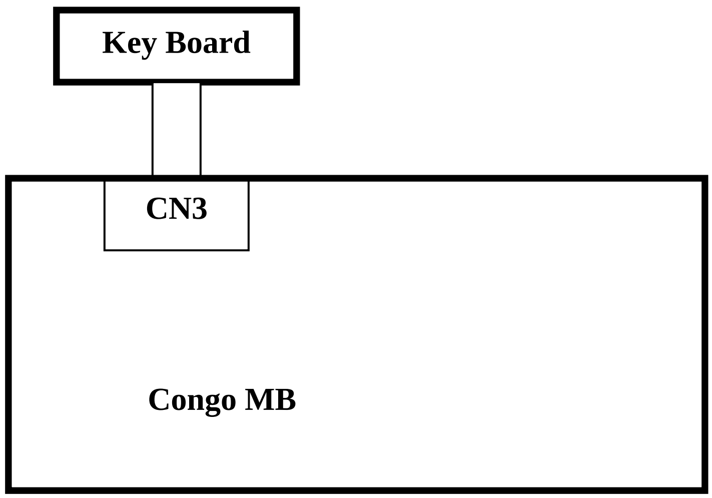
Execute the Keyboard Test (DIAGNOSTIC TEST) and Pressed key display test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics,* for more information on how to perform the test program.

If an error occurs, go to Procedure 2. If an error does not occur, keyboard is functioning properly.

Procedure 2 Connector and Replacement Check

The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure keyboard cable is firmly connected to system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 Keyboard may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.7 Touch pad Troubleshooting

To check if the computer's touch pad is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

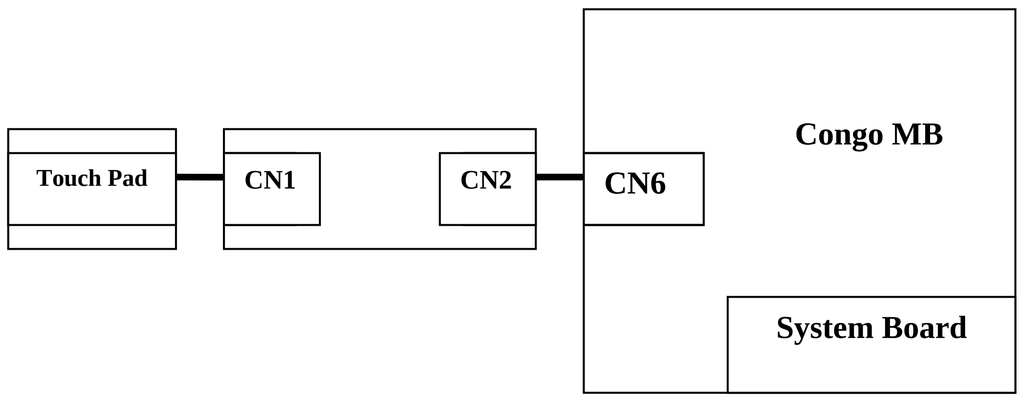
Execute the Touch pad test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

If an error occurs, go to Procedure 2. If an error does not occur, Touch pad is functioning properly.

Procedure 2 Connector and Replacement Check

The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the cable is firmly connected to system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

Check 2 Touch Pad or the cable may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*

2.8 Display Troubleshooting

To check if the computer's display is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector and Cable Check

Procedure 4: Replacement Check

Procedure 1 External Monitor Check

Connect an external monitor to the computer's external monitor port, then boot the computer. The computer automatically detects the external monitor.

When "Power on Display" setting is "Auto-Selected" (Default) in BIOS Setup Menu.
If this setting is "System LCD only", external monitor cannot be displayed. The computer automatically detects the external monitor.

If the external monitor works correctly, the internal LCD may be faulty. Go to Procedure 3.

If the external monitor appears to have the same problem as the internal monitor, system board may be faulty. Go to Procedure 2.

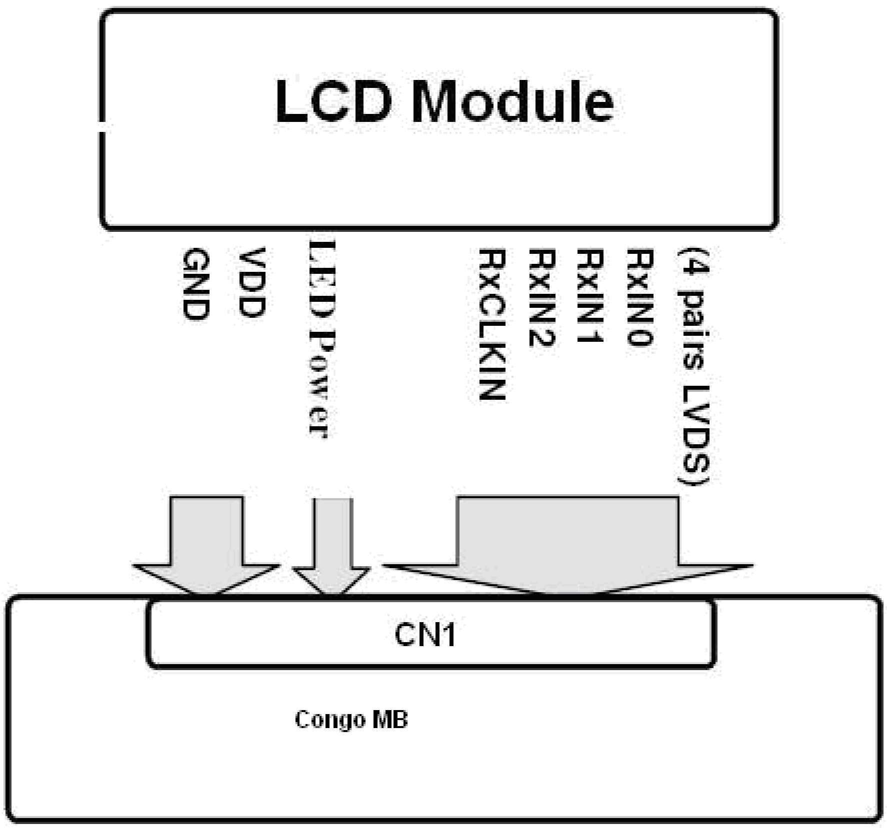
Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored in Diagnostics disk. This program checks the display controller on system board. Insert the Diagnostics disk, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 3.

Procedure 3 Connector and Cable Check

LCD Module is connected to system board by an LCD. Their cables may be disconnected from system board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connection is loose, reconnect firmly and restart the computer. If the problem still occurs, go to Procedure 4.



Procedure 4 Replacement Check

LCD module, LCD cable are connected to display circuits. Any of these components may be faulty. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

If characters or graphics on the internal display are not displayed clearly, perform Check 1.

If some screen functions do not operate properly, perform Check 2.

If LED backlight remains lit when the display is closed, perform Check 3.

Check1 LCD cable may be faulty. Replace LCD cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 2.

Check 2 LCD module may be faulty. Replace LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.9 LAN Troubleshooting

To check if the computer's LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

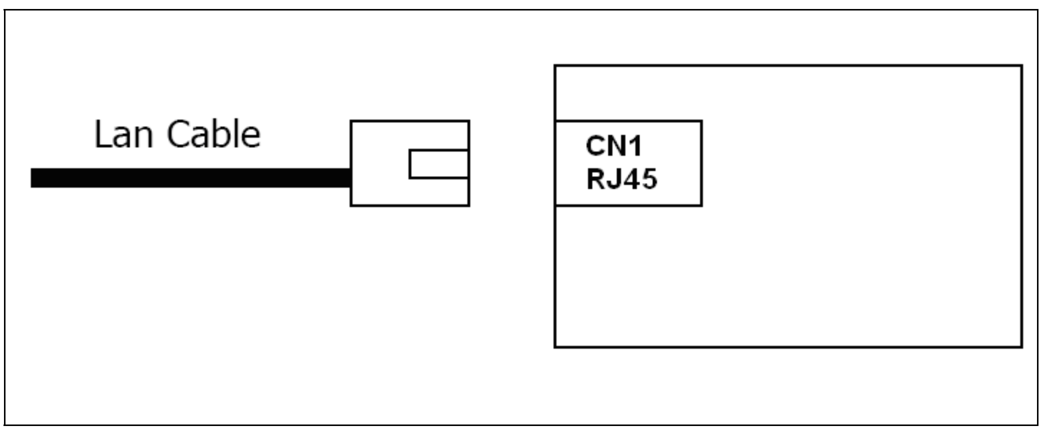
Execute LAN test in the LAN test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The LAN function is embedded on system board. If LAN malfunctions, its connection is defective or LAN cable and system board may be faulty.

Check 1 Make sure LAN cable is firmly connected to the connector CN1. If the problem still occurs, perform Check 2.



No Separated LAN BOARD , it's assembled.

Check 2 LAN cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.10 Wireless LAN Troubleshooting

To check if the computer's Wireless LAN is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

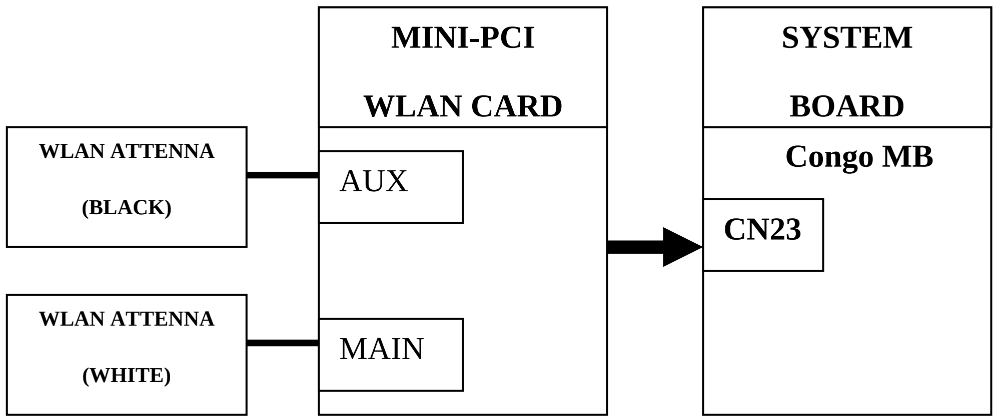
Before starting the test, make sure the wireless communication switch is set in the ON position.

Check 1 Execute Wireless LAN test program to check the transmitting-receiving function of wireless LAN. You will need a second computer that can communicate by wireless LAN. Perform the test following the instructions described in Chapter 3.

If the computer passes the test, the function is correctly working. If the computer does not pass the test, perform Procedure 2.

Procedure 2 Antennas' Connection Check

The wireless LAN function-wiring diagram is shown below:



Any of the connections may be defective. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the wireless communication switch is “On”.

If the switch is “Off”, turn it “On”. If the problem still occurs, perform Check 2.

Check 2 Make sure wireless LAN card (Mini-PCI) is firmly connected to the CN2200 on system board. If the connector is defective, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 3.

Check 3 Make sure that wireless LAN antenna cables (black and white) are firmly connected to the connectors on Wireless LAN card. If wireless LAN antenna cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

Procedure 3 Replacement Check

Wireless LAN card, wireless LAN antenna or system board may be faulty. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

Check 1 Wireless LAN antenna may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 2.

Check 2 Wireless LAN card may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.

Check3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.11 Sound Troubleshooting

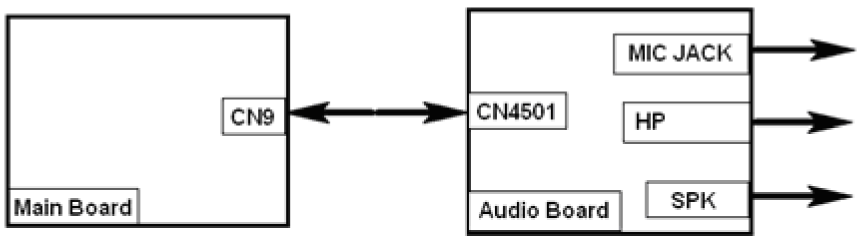
To check if the sound function is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check

Procedure 2: Replacement Check

Procedure 1 Connector Check

The connection of sound system is shown in the following figure.



As the connection may be defective, disassemble the PC and check each connection.

If the problem still occurs, go to Procedure 2.

Procedure 2 Replacement Check

- ❑ If External microphone/Headphone does not work properly, perform check 1.
- ❑ If internal microphone /Speaker do not work properly, perform check 2.
- ❑ If HP out does not work properly, perform check 3.
- ❑ If Volume control does not work properly, perform check 4.

Check 1 External microphone/Headphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 2 Internal microphone /Speaker may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 3 HP out may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 4 Volume control may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 6.

Check 5 Flat cables between AD board/Speaker and system board may be faulty. Replace it with new cable following the instructions in Chapter 4. If the problem still occurs, perform Check 6.

Check 6 Audio board/System board may be faulty. Replace it with a new one following the instructions in Chapter 4.

2.12 Bluetooth Troubleshooting

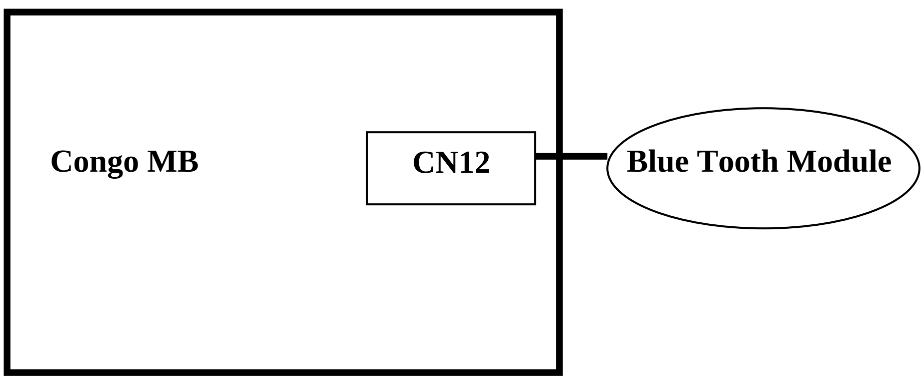
To check if the computer's Bluetooth is malfunctioning or not, follow the troubleshooting procedure below as instructed.

Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

The Bluetooth module is connected to system board. If Bluetooth malfunctions, its connection is defective or Bluetooth cable and system board may be faulty.

Check 1 Make sure Bluetooth cable is firmly connected to the connector CN12 (system board). If the problem still occurs, perform Check 2.



Check 2 Bluetooth cable may be faulty. Replace it with a new one. If the problem s till occurs, perform Check 3.

Check 3 Bluetooth may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.13 HDMI Troubleshooting

To check if the computer's HDMI is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: External HDMI Monitor Check

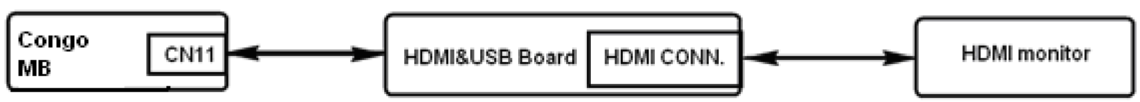
Procedure 2: Connector and Cable Check

Procedure 3: Replacement Check

Procedure 1 Connector Check and Replacement Check

The HDMI port is connected to system board. If HDMI malfunctions, its connection is defective or HDMI cable and system board may be faulty.

Check 1 Make sure HDMI cable is firmly connected to the connector CN11 (system board). If the problem still occurs, perform Procedure 2.



Procedure 2 External Monitor Check

Connect an external monitor to the computer's HDMI port, and then boot the computer. The computer automatically detects the external monitor.

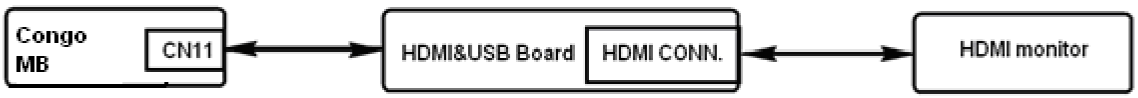
If the external monitor works correctly, the internal LCD may be faulty. Go to Procedure 3.

If the external monitor appears to have the same problem as the internal monitor, system board may be faulty. Go to Procedure 2.

Procedure 3 Connector and Cable Check

HDMI monitor connected to HDMI&USB board by an HDMI cable.

If the connection is loose, reconnect firmly and restart the computer. If the problem still occurs, go to Procedure 4.



Procedure 4 Replacement Check

HDMI signals are connected to display circuits via HDMI cable and HDMI&USB board. Any of these components may be faulty. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

If characters or graphics on the internal display are not displayed clearly, perform Check 1.

If some screen functions do not operate properly, perform Check 4.

Check 1 HDMI cable may be faulty. Replace HDMI cable with a new one following the instructions in Chapter 1, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 2.

Check 2 HDMI monitor may be faulty. Replace HDMI monitor with a new one following the instructions in Chapter 2, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3

Check 3 HDMI&USB board may be faulty. Replace it with a new one following the instructions in Chapter 3, *Replacement Procedure*.

Check 4 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.14 Memory Troubleshooting

Memory troubleshooting can following below procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connect Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

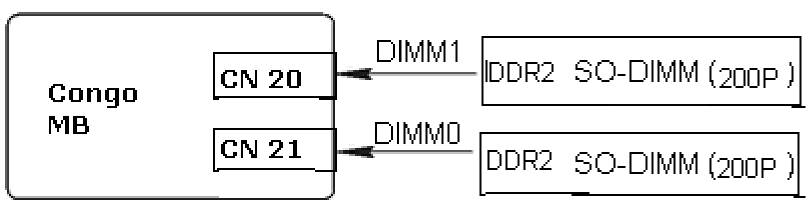
Execute Memory test in the Memory test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connect Check and Replacement Check

Memory function abnormal always accompany NB run abnormal, the RAM may be not insert correctly or slot is defective or RAM and system board may be faulty.

Check 1 Make sure RAM is correctly and firmly inserted to the slots. If the problem still occurs, perform Check 2.



Check 2 RAM may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 The slot and MB may be faulty. Replace it with a new one following the instruction in Chapter 4.

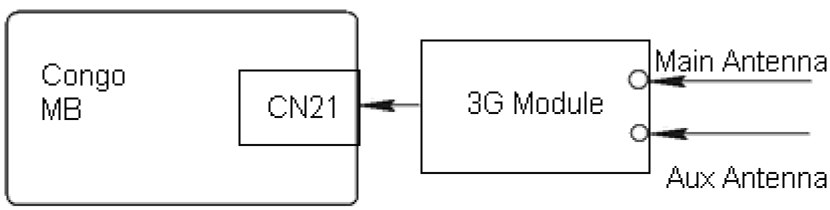
2.15 3G Troubleshooting

To check if the computer's 3G is malfunctioning or not, follow the troubleshooting procedure below as instructed.

Procedure 1 Connector Check and Replacement Check

The 3G module is connected to system board. If 3G malfunctions, its connection is defective or Antenna and system board may be faulty.

Check 1 Make sure 3G is firmly connected to the connector CN21 (system board). If the problem still occurs, perform Check 2.



Check 2 Antenna may be faulty. Replace it with new one. If the problem s till occurs, perform Check 3.

Check 3 3G card may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.16 Camera Troubleshooting

To check if the computer's Camera is malfunctioning or not, follow the troubleshooting procedure below as instructed.

Procedure 1: Camera Execution Check

Procedure 2: Connect Check and Replacement Check

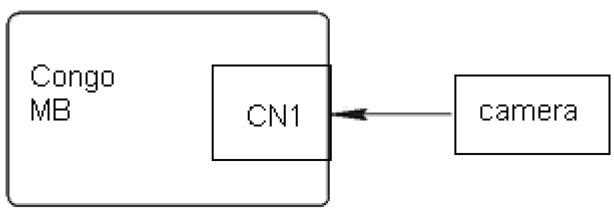
Procedure 1 Camera Execution Check

Open photo/video tool to look if there is an image. If not, go to Procedure 2.

Procedure 2 Connect Check and Replacement Check

The CCD cable is connected to system board. If camera malfunctions, its connection may be defective or CCD cable and system board may be faulty.

Check 1 Make sure the other side of CCD cable is correctly and firmly inserted to the CN1 in MB. If the problem still occurs, perform Check 2.



Check 2 CCD cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 Camera may be faulty. Replace it with a new one following the instruction in Chapter 4.

Check 4 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.17 Microphone Troubleshooting

Microphone troubleshooting can following below procedures as instructed.

Procedure 1: Sound Recorder Execution Check

Procedure 2: Connect Check and Replacement Check

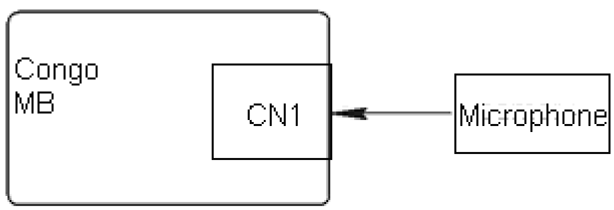
Procedure 1 Sound Recorder Execution Check

Open accessory to find sound recorder tool, try to record a length of sound, and then replay it to see if microphone is working normal. If not, go to Procedure 2.

Procedure 2 Connect Check and Replacement Check

The Microphone is combined with CCD cable which is connected to system board. If microphone malfunctions, its connection may be defective or CCD cable and system board may be faulty.

Check 1 Make sure the other side of CCD cable is correctly and firmly inserted to the CN1 in MB. If the problem still occurs, perform Check 2.



Check 2 CCD cable or Microphone may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.18 CRT Troubleshooting

To check if the computer's CRT is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: External Monitor Check

Procedure 2: Connector and Cable Check

Procedure 3: Replacement Check

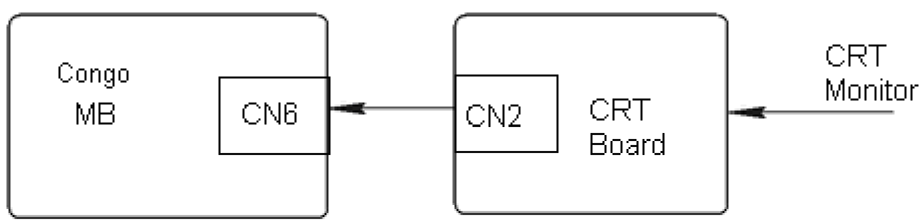
Procedure 1 External Monitor Check

Connect an external monitor to the computer's external CRT port, and then to see if you can transfer video image to external monitor. If not, go procedure2.

Procedure 2 Connector and Cable Check

CRT board is connected to system board by a CRT cable. Their cables may be disconnected from system board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connection is loose, reconnect firmly and restart the computer. If the problem still occurs, go to Procedure 3.



Procedure 3 Replacement Check

Check 1 CRT cable may be faulty. Replace CRT cable with a new one following the instructions in Chapter 4--*Replacement Procedure*, and then test again. If the problem still occurs, perform Check 2.

Check 2 CRT board may be faulty. Replace CRT board with a new one following the instructions in Chapter 4, *Replacement Procedure,* and then test again. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.19 USB Board Troubleshooting

Flatiron carries 3 USB port. To check if the computer's USB port is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connect Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

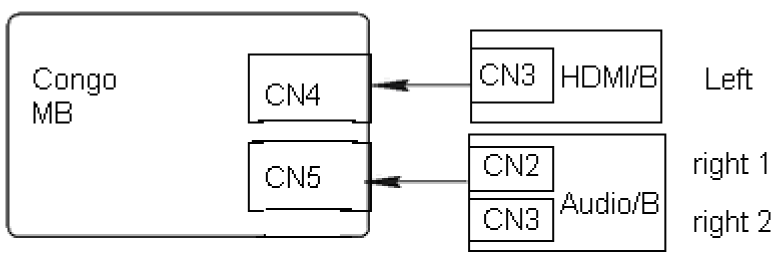
Execute USB test in the USB test program.

If any error is detected by the test, go to Procedure 2.

Procedure 2 Connect Check and Replacement Check

USB is connected to system board by a HDMI cable and an Audio cable. These cables may be disconnected from system board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

Check 1 Make sure HDMI cable and Audio cable are correctly and firmly inserted. If the problem still occurs, perform Check 2.



Check 2 HDMI/B or Audio/B may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 The system board may be faulty. Replace it with a new one following the instruction in Chapter 4.

2.20 LED Troubleshooting

These are 7 LED lights at Top assy. From left to right, the Open statuses of them represent functions as below.

1. AC-IN 2. Power 3. Battery 4.HDD

5. Cardreader 6.W-Lan 7.LED

To check if the computer's LED is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Each function Execution Check

Procedure 2: Connect Check and Replacement Check

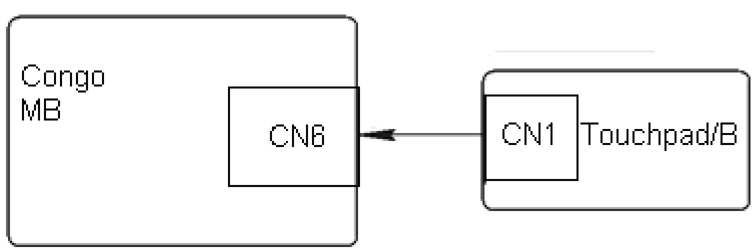
Procedure 1 Each function Execution Check

In this procedure, you must first make sure all components except LED are working right. Then you can execute the related function to check if the corresponding LED is on or not. If not, please go to Procedure2.

Procedure 2 Connect Check and Replacement Check

LED light is combined with Touchpad/B which is connected to system board by a TP-MB cable. This cable may be disconnected from system board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

Check 1 Make sure TP-MB is correctly and firmly inserted. If the problem still occurs, perform Check 2.



Check 2 Touchpad/B may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3 The system board may be faulty. Replace it with a new one following the instruction in Chapter 4.

Chapter 3
Diagnostic Programs

Chapter 3 Contents

Chapter 3

Diagnostic Programs

3.1 Tests and Diagnostics Software Overview

This chapter explains how to use the Tests and Diagnostics Software for the Satellite T130D, Satellite Pro T130D and PORTEGE T130D computer systems.

> ***NOTES**: Before starting the Tests and Diagnostics software:*
>
> 1. *Check all cables for loose connections.*
> 2. *Exit any application and close Windows.*

The Diagnostics Menu consists of the following options:

- Diagnostic Test
- Running Test
- DMI Information
- Log Utilities
- System Configuration
- Option

The Diagnostic Test Menu consists of the following functional tests:

- System Test
- Memory Test
- Keyboard Test
- Display Test
- Floppy Disk Test
- Hard Disk Test
- Real Time Clock Test
- Cache Memory Test
- High Resolution Display Test
- Multimedia Test
- Memory2 Test
- FDD & HDD Error Retry Count Set

The following equipment is required to perform some of the diagnostic test programs:

- The Diagnostics Disk (all tests)
- A formatted working disk for the floppy disk drive test (all tests)
- A CD test media (Toshiba Backup CD ROM for the CD-ROM test)

The following sections detail the tests contained within the Diagnostic Test Menu. Refer to Sections 3.18, 3.19, 3.20 and, 3.21 for detailed information on the remaining functions of the Tests and Diagnostics software.

3.2 Executing the Diagnostic Test

Free-DOS is required to run the Diagnostics Program. To start the programs follow these steps:

1. Create a Free-DOS bootable disk and copy all the files from the Tests and Diagnostics software to the disk.

2. Insert the boot disk into the computer's floppy disk drive and turn on the computer.

> ***NOTES**: If error message display "Sorry. This Model Type Not Match This Machine":*
>
> ***Please Check:***
>
> *1. You test disk is match this model, ex. disk is 14" but machine is 13".*
>
> *2. The M/B EEPROM project type is math your test disk, if not, please use WDMI3.EXE to modify with right LCD size.*

The following screen displays:

```
TOSHIBA Satellite(Pro) P500 Diagnostics        ↑↓→←:Select item
Version v1.00                                  ESC   :Escape

   [DIAGNOSTICS MENU]

01.DIAGNOSTIC TEST
02.RUNNING TEST
03.DMI INFORMATION
04.LOG UTILITIES
05.SYSTEM CONFIGURATION
06.OPTION
99.EXIT
```

3. To select the Diagnostic Test from the Diagnostics Menu use the arrow keys to set the highlight bar to **01** and press **Enter**.

The following menu displays:

```
TOSHIBA Satellite(Pro) P500 Diagnostics           ↑↓→←:Select item
Version V1.00                                     ESC  :Escape

   [DIAGNOSTICS MENU]

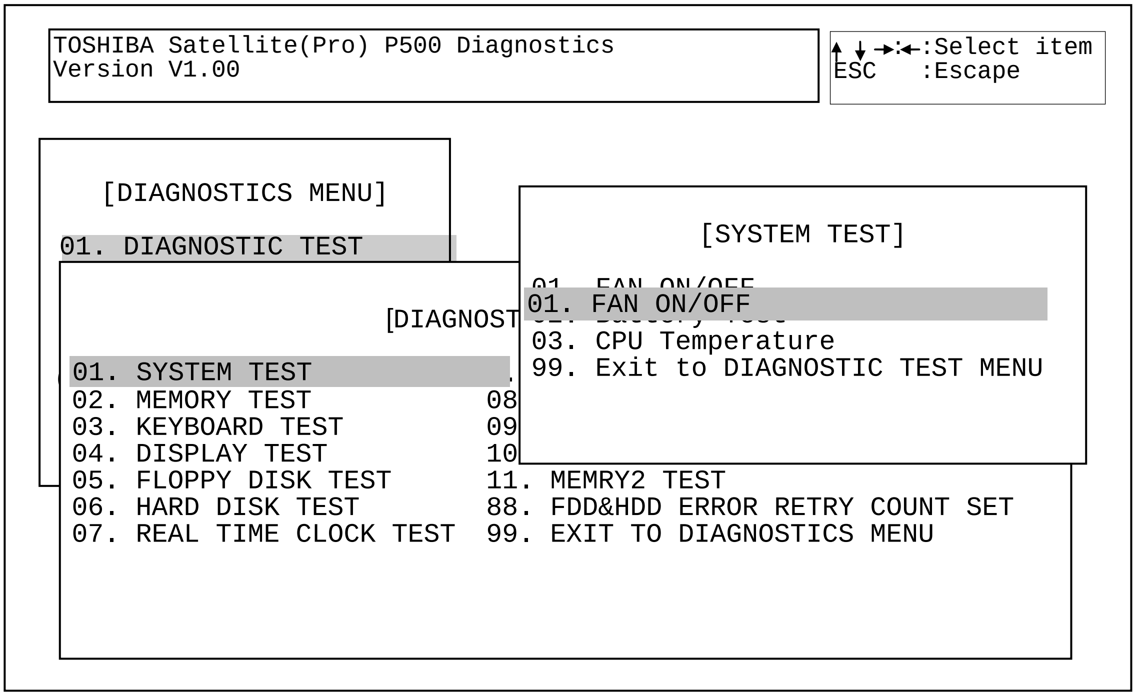
 01. DIAGNOSTIC TEST

                    [DIAGNOSTIC TEST MENU]

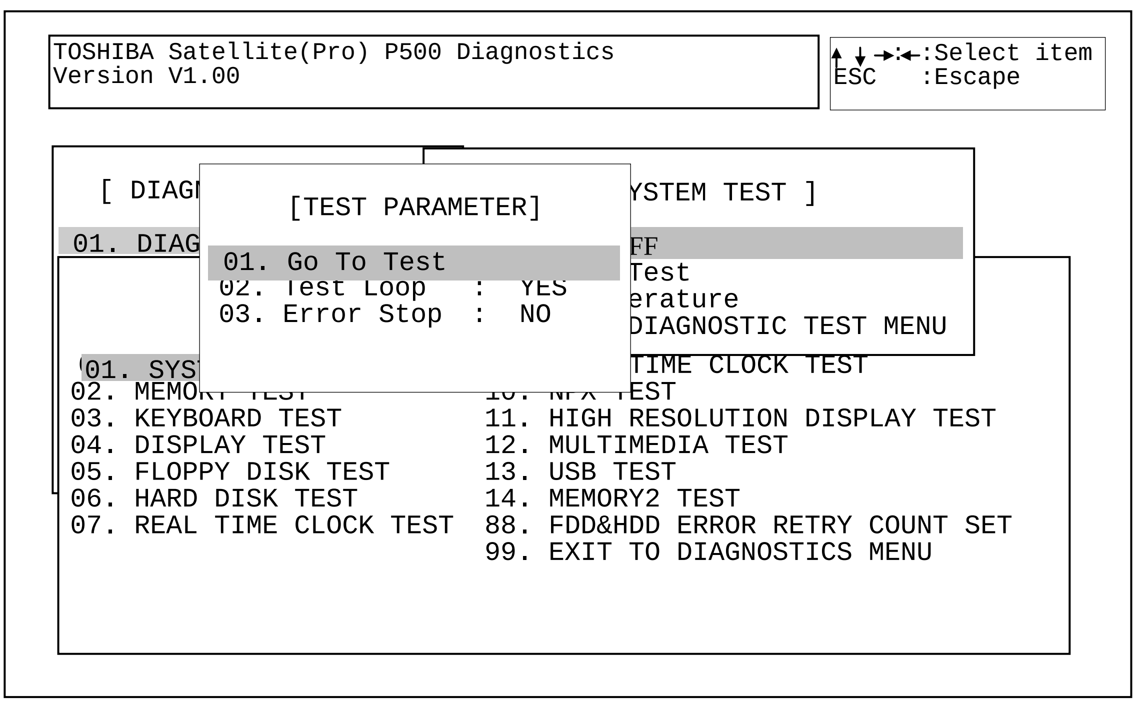
01. SYSTEM TEST                 08. CACHE MEMORY TEST
02. MEMORY TEST                 09. HIGH RESOLUTION DISPLAY TEST
03. KEYBOARD TEST               10. MULTIMEDIA TEST
04. DISPLAY TEST                11. MEMORY2 TEST
05. FLOPPY DISK TEST            88. FDD&HDD ERROR RETRY COUNT SET
06. HARD DISK TEST              99. EXIT TO DIAGNOSTICS MENU
07. REAL TIME CLOCK TEST
```

Refer to Sections 3.4 through 3.14 for detailed descriptions of Diagnostics Tests 1 through 11. Item 88 sets the floppy disk drive and hard disk drive errors retry count. Item 99 exits the submenu of the Diagnostic Test and returns to the Diagnostics Menu.

4. Select the subtest you want to execute and press **Enter**. The following menu displays:



5. Select the desired test from the subtest menu and press **Enter**. The following Test Parameter menu displays:



Use the arrow keys to highlight the desired option and press **Enter**.

***NOTES**: The Item2 and 3 of Test Parameter are not used by some tests.*

Go To Test
Move the highlight bar to *Go to Test* and press **Enter** to start executing the test.

Test Loop
Select **NO** to return the screen to the subtest menu after the test is complete.
Select **YES** to set the test to run continuously until it is halted by the user.

Error Stop
Select **NO** to keep the test running even if an error is found.
Select **YES** to stop the test program when an error is found and display the HALT OPERATION screen as shown below:

```
[[HALT OPERATION]]
  1: Test end
  2: Continue
  3: Retry
```

These three selections have the following functions:

1: Terminates the test program and exits to the subtest menu.
2: Continues the test from the error.
3: Restarts the test from the beginning.

Use the arrow keys to move the cursor to the desired option and press **Enter**.

Table 3-1 in Section 3.3 lists the function of each test on the subtest menu. Table 3-2 in Section 3.15 lists the error codes and error status for each error.

3.3 Subtest names

Table 3-3-1 lists the subtest names for each test program in the Diagnostic Test menu.

No.	Test Name	No.	Subtest Name
01	SYSTEM TEST	01	FAN ON/OFF check
		02	Battery TEST
		03	CPU Temperature
		04	3D HDD Protection Test (90d)
02	MEMORY TEST	01	Conventional Memory
		02	Protected Mode
		03	Protected Mode (32MB-MAX)
		04	RAM Refresh
		05	Stress Test
03	KEYBOARD TEST	01	Pressed Key Display [85KBD]
		02	Pressed Key Display [85KBD]
		03	Pressed Key Display [85KBD]
		04	PS/2 Mouse (Pointing 2Button)
04	DISPLAY TEST	01	Character Attributes
		02	Character Set
		03	80* 25 Character Display
		04	320* 200 Graphics Display
		05	640* 200 Graphics Display
		06	640* 480 Graphics Display
		07	Display Page
		08	“H” Pattern Display
		09	Video DAC Register W/R/C
		10	Color Graphics Display
		11	Color Attributes Display
		12	Color Tiling

Table 3-3-1 Subtest Names (1/3)

No.	Test Name	No.	Subtest Name
05	FLOPPY DISK TEST	01	Sequential Read
		02	Sequential W/R/C
		03	Random Address/Data
		04	Write Specified Address
		05	Read Specified Address
06	HARD DISK TEST	01	Sequential Read
		02	Address Uniqueness
		03	Random Address Data
		04	Cross Talk and Peek Shift
		05	Write Specified Address
		06	Read Specified Address
		07	Sequential Write
		08	W-R-C Specified Address
07	REAL TIME CLOCK TEST	01	Real Time Test
		02	Backup Memory Test
		03	Real Time Carry Test
08	CACHE MEMORY TEST	01	Constant Data Test
		02	Address Pattern Test
		03	Increment/Decrement Test
		04	Bit Shift Pattern Test
		05	*Write Disturb Test
		06	Checker Board Test
		07	Marching Test
		08	Working Data Test
09	HIGH RESOLUTION	01	VRAM W/R/C Test
	DISPLAY TEST	02	640* 480 Mode Display
		03	800* 600 Mode Display
		04	1024* 768 Mode Display
		05	“H” Pattern Display
		06	Focus Test (“E” Pattern)

Table 3-3-1 Subtest Names (2/3)

No.	Test Name	No.	Subtest Name
10	MULTIMEDIA TEST	01	Sequential Read Test
		02	Random Read Test
		03	Read Specified Address Test
		04	1 point W/R/C Test
11	MEMORY2	01	All one/zero Test
		02	Walking 1/Walking 0 Test(Left)
		03	Walking 1/Walking 0 Test(Right)
		04	Walking 1/Walking 0 Test(Left /Right)

Table 3-3-1 Subtest Names (3/3)

**This test cannot support.*

3.4 System Test

To execute the System Test select **01** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The System Test contains three subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 FAN ON/OFF Checking

Select 1,2,3 to control FAN on/off , 1=Fan on , 2=Fan off , 3=Exit .

[BOIFAN2.EXE] Program Version: 1.0
1: Fan On 2: Fan Off 3: Exit
Fan1 Status on Fan1RPM: 5000 or Fan1 Status OFF Fan1RPM: 0
Fan2 Status on Fan2RPM: 2500 or Fan2 Status OFF Fan2RPM: 0

Subtest 02 Battery Test

This will display battery information for check, press [ESC] to exit.

[BOIPCU.EXE] Program Version: 1.0 03-27-2007

Voltage	: 12522 mV	Remaining capacity alarm	: 400 mAh
Temperature	: 24.4 ‘C	Remaining time alarm	: 10 min
Current	: 1330 mA	Battery mode	: 0
Average current	: 1327 mA	AtRate	: 0 mA
Relative state of charge	: 93 %	At rate time to full	: 65535 min
Absolute state of charge	: 89 %	At rate time to empty	: 65535 min
Remaining capacity	: 3546 mAh	At rate O. K.	: FFFF
Full charge capacity	: 3800 mAh	Maximum error	: 2 %
Run time to empty	: -1 min.	Charging current	: 2800 mA
Average time to empty	: -1 min.	Charging voltage	: 12600 mA
Average time to full	: 101 min.	Manufacturer name	: SANYO
Cycle count	: 10 times	Device name	: NS2P3SZDNVWR
Design capacity	: 4000 mAh	Device chemistry	: LION
Design voltage	: 11100 mV	Manufacturer data	: 0
Specification information	: 2.1	Manufacture date	: 9/13/2005
Serial no.	: 32009		
STATUS	: INIT		

Press [ESC] KEY to exit

Subtest 03 CPU Temperature

This will display CPU Temperature for check, press [ESC] to exit .

[CPU_TEMP.EXE] Program Version: 1.3 03-09-2009
CPU Temperature: XX
GPU Temperature: XX

> ***NOTES****: If no external Graphics, GPU not report temperature.*

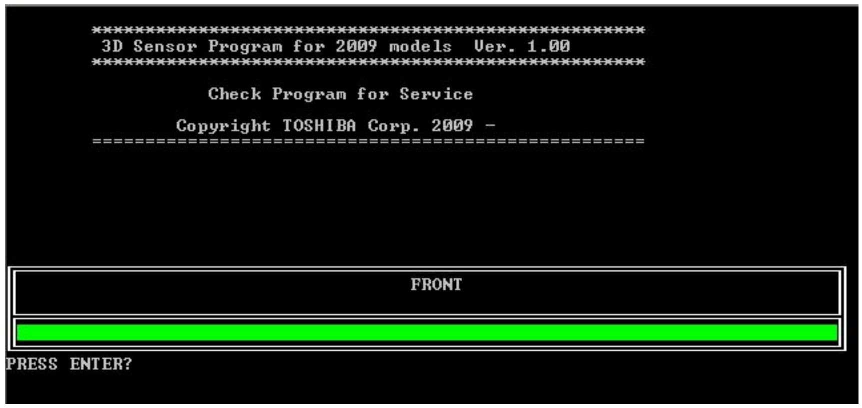
Subtest 04 3D HDD Protection Test (90d)

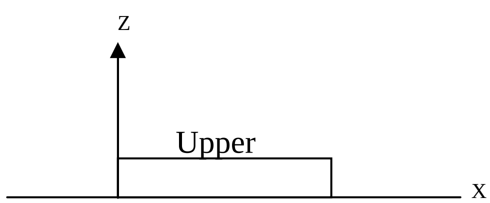
1. For Field inspection T&D.
   This program judges by sampling five kinds of data shown below.

No	Item	Contents
1	Access platform.	An access platform is leveling.
2	Test Fixture	The Fixture which fixes PC by 90 degree inclination is used. Vibration/shock doesn't take a PCB at the time of T&D inspection.

<table>
<tr>
<td>3</td>
<td>Test1</td>
<td>The display of a test program and the set method of PC are shown below.

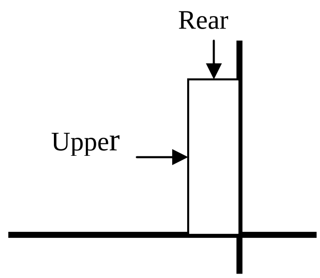
Display of a Test Program
The portion which PC and Test-Fixture contact is green.

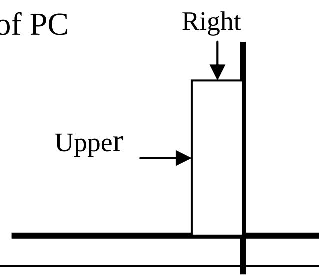


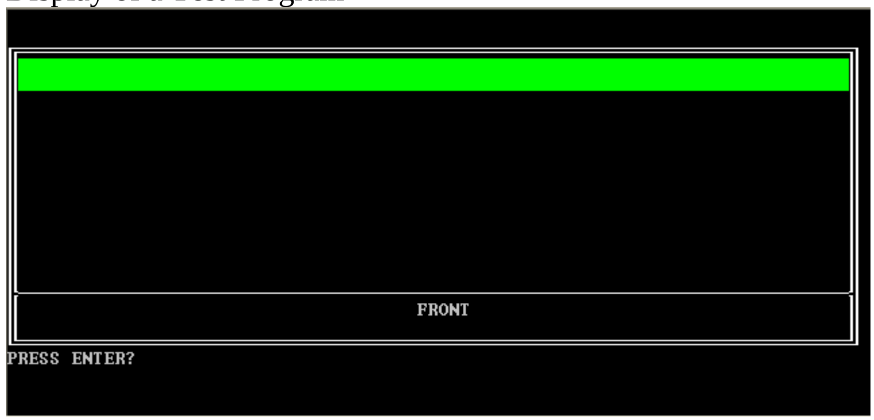
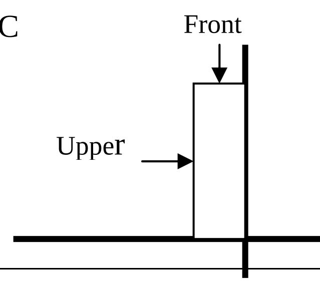
Set method of PC

</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Judgment
If all data is less than ranges, it will be OK.</td>
</tr>
</table>

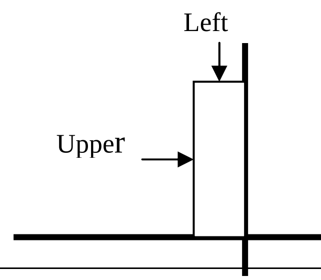
<table>
<tr><td rowspan="2">4</td><td rowspan="2">Test2</td><td>The display of a test program and the set method of PC are shown below.

Display of a Test Program

Set method of PC
</td></tr>
<tr><td>Judgment
If all data is less than ranges, it will be OK.</td></tr>
</table>

5	Test3	The display of a test program and the set method of PC are shown below. Display of a Test Program  Set method of PC 
		Judgment If all data is less than ranges, it will be OK.

6	Test4	The display of a test program and the set method of PC are shown below. Display of a Test Program  Set method of PC 
		Judgment If all data is less than ranges, it will be OK.

7	Test5	The display of a test program and the set method of PC are shown below. Display of a Test Program  Set method of PC 
		Judgment If all data is less than ranges, it will be OK.
8	Inspection	Judgment If all data is less than ranges, it will be OK.
9	Setting Calibration data	When an inspection result is O.K., calibration at HPC.

2. Test Result

A test result is displayed when a test is completed. A display of result is O.K. or NG.
And an error flag is returned at the end of a program.
OK is 0.
NG is 1.

3.5 Memory Test

To execute the Memory Test select **02** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Memory Test contains five subtests that test the computer's memory. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE****: If* ***NO*** *is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. When the test is complete the Memory Test menu displays.*
>
> *If* ***YES*** *is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. Press* ***Ctrl + break*** *to return to the Memory Test menu.*

Subtest 01 Conventional Memory

This subtest first writes test data patterns to conventional memory (0 to 640 KB), then reads the new data and compares the result with the original data patterns.

If a compare error occurs, the write data, read data, and test address display on the screen. Addresses are displayed in 4KB increments during the test.

Test Process:

1. Byte Enable Test
   One bit write/ 8 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

2. Byte Enable Test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

3. Data bus test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.

4. Fixed data test
   "16 bit write/ 16 bit read" is executed and the new data is compared to the original data.
   Test data = FFFFFFFFH, 00000000H, 80018001H

5. Address pattern test
   "16 bit write and 16 bit read" of address pattern data is executed and the new data is compared with the original data.
   Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 02 Protected Modes

This subtest first writes data patterns and address data from 1 to 32 MB, then reads the new data and compares the result with the original data patterns. Addresses are displayed in 64KB increments during the test.

. **Test Process:**

1. Byte Enable Test
   One bit write/ 8 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

2. Byte Enable Test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

3. Data bus test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.

4. Fixed data test
   "16 bit write/ 16 bit read" is executed and the new data is compared to the original data.
   Test data = FFFFFFFFH, 00000000H, 80018001H
5. Address pattern test
   "16 bit write and 16 bit read" of address pattern data is executed and the new data is compared with the original data.
   Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 03 Protected Modes [32MB - MAX]

This subtest first writes data patterns and address data from 32MB to the maximum installed memory, reads the new data, and then compares the result

with the original data patterns. Addresses are displayed in 64KB increments during the test.

Test Process:

1. Byte Enable Test
   One bit write/ 8 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

2. Byte Enable Test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = CCAA5533H, 80000000H

3. Data bus test
   "One bit write/16 bit read" is executed and the new data is compared with the original data.
   Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.

4. Fixed data test
   "16 bit write/ 16 bit read" is executed and the new data is compared to the original data.
   Test data = FFFFFFFFH, 00000000H, 80018001H
5. Address pattern test
   "16 bit write and 16 bit read" of address pattern data is executed and the new data is compared with the original data.
   Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 04 RAM Refresh

This subtest writes a data pattern (CCAA5533H) in 4KB from 0 to the maximum installed memory, then waits for a memory refresh cycle (16 ms or more), reads the new data, and compares the result with the original data pattern.

Test Process:

1. Checks the memory size to determine the maximum size of installed memory.

2. Tests memory addresses 0 to the maximum installed.

3. Writes, reads, and compares test data after a memory refresh cycle (16ms or more).

> ***NOTE:*** *There may be a short delay between write and read operations, depending on the memory size.*

Subtest 05 Stress Test

This subtest writes the following 16KB data patterns to the Write/Read Buffer in conventional memory.

```
data:   FFFFFFFFFFFFFFFF0000000000000000
        5555555555555555AAAAAAAAAAAAAAAA
        CCCCCCCCCCCCCCCC3333333333333333
        0000000000000000FFFFFFFFFFFFFFFF
        AAAAAAAAAAAAAAAA5555555555555555
        3333333333333333CCCCCCCCCCCCCCCC
        FFFFFFFFFFFFFFFF0000000000000000
        0000000000000000FFFFFFFFFFFFFFFF
        5555555555555555AAAAAAAAAAAAAAAA
        AAAAAAAAAAAAAAAA5555555555555555
        CCCCCCCCCCCCCCCC3333333333333333
        3333333333333333CCCCCCCCCCCCCCCC
```

3.6 Keyboard Test

To execute the Keyboard Test select **03** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Keyboard Test contains five subtests that test the computer's keyboard and mouse actions. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE**: The Test Loop and Error Stop parameters are not enabled for the Keyboard test.*

Subtest 01 Pressed Key Display [85Keyboard]

When you execute this subtest, the keyboard layout is drawn on the display. When any key is pressed, the corresponding key on the screen changes from light to dark. Holding a key down enables the auto-repeat function which causes the key's display character to blink.

```
[[[Press Key Display]]]

Layout of a keyboard (85keys)
```

Subtest 02 Pressed Key Display [85Keyboard]

This subtest is used for the 85 keyboard and functions the same as Subtest 1.

Subtest 03 Pressed Key Display [85 Keyboard]

This subtest is used for the 85 keyboard and functions the same as Subtest 1.

Subtest 04 Hot Key Display [9 Key]

This subtest is used for the 9 hot key and functions the same as Subtest 1.

ECO MUTE MUSIC PLAY BACK NEXT VOL- VOL+ WLAN

Subtest 05 Hot Key Display [1 Key]

This subtest is used for the 1 hot key and functions the same as Subtest 1.

WLAN

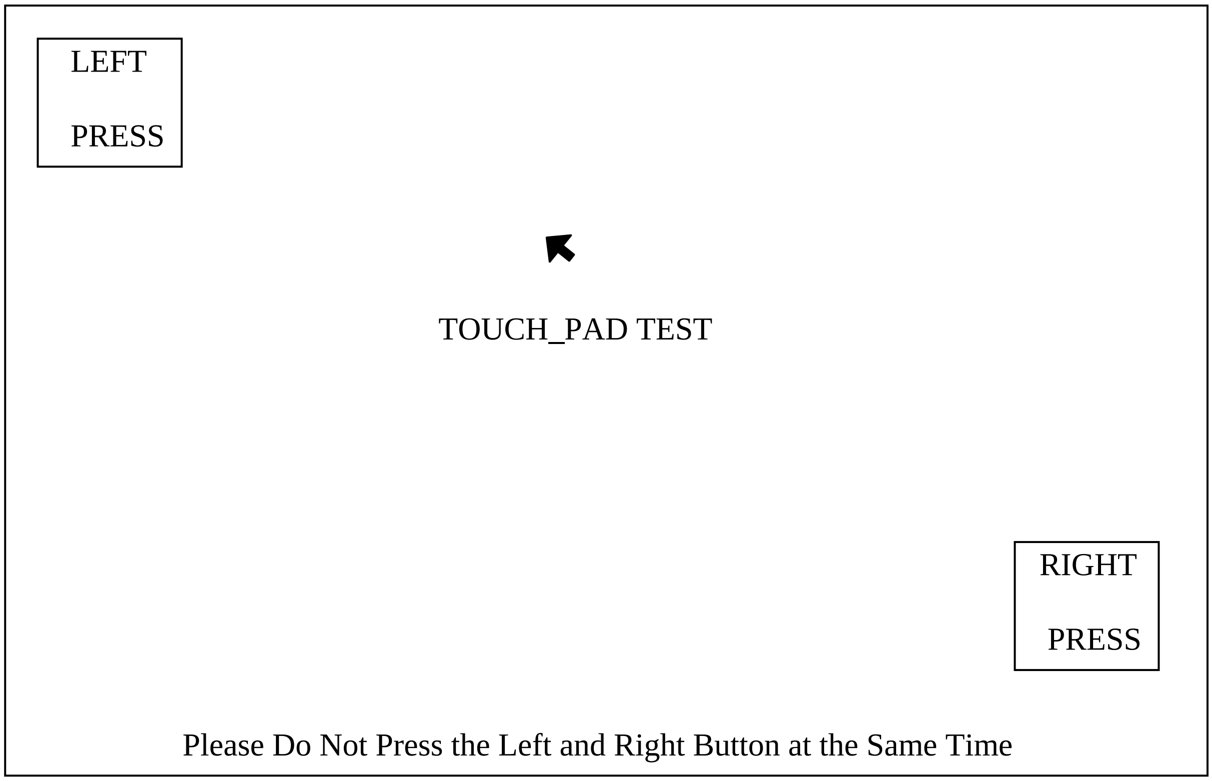
Subtest 06 PS/2 Mouse (Pointing)

This subtest checks the function of mouse as shown below.

A) Pointing device (mouse)
B) Mouse buttons

Please move cursor to upper left and press left button , screen will display <PRESS> in left rectangle , move cursor to lower right and press right button , screen will display <PRESS> in right rectangle , the program exit .

If left and right button short, screen will display <Left and Right Button maybe short >, the program exit.


LEFT
PRESS
TOUCH_PAD TEST
RIGHT
PRESS
Please Do Not Press the Left and Right Button at the Same Time

3.7 Display Test

To execute the Display Test select **04** from the Diagnostic Test Menu, press **Enter** and follow the directions displayed on the screen. The Display Test contains twelve subtests that test the display in various modes. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Character Attributes

This subtest displays character attributes and color attributes. The character attributes are: normal, intensified, reverse, and blinking. The color attributes are: blue, red, magenta, cyan, yellow, and white. These seven colors each display a background color, foreground color and high resolution color. The screen below displays when this subtest is executed.

```
CHARACTER ATTRIBUTES

  NEXT LINE SHOWS NORMAL DISPLAY
       NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN

 NEXT LINE SHOWS INTENSIFIED DISPLAY
       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

 NEXT LINE SHOWS REVERSE DISPLAY
       RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR

 NEXT RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
       BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB


 [    ]   [    ]   [    ]  BLUE
 [    ]   [    ]   [    ]  RED
 [    ]   [    ]   [    ]  MAGENTA
 [    ]   [    ]   [    ]  GREEN
 [    ]   [    ]   [    ]  CYAN
 [    ]   [    ]   [    ]  YELLOW
 [    ]   [    ]   [    ]  WHITE

 Press [ Enter ] KEY
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 02 Character Set

This subtest displays the character codes 00H - FFH, using Mode 01H (40*25). The screen below displays when this subtest is executed.

```
 CHARACTER SET IN 40*25

 ☺ ☻ ♥ ♦ ♣ ♠ • ◘ ○ ◙ ♂ ♀ ♪ ♫ ☼ ► ◄ ↕ ‼ ¶ § ▬ ↨ ↑ ↓ → ← ∟ ↔ ▲ ▼   ! " # $ % & '
( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [ \ ] ^ _ ` a b c d e f g h i j k l m n o p q r s t u v w
x y z { | } ~ ⌂ Ç ü é â ä à å ç ê ë è ï î ì Ä Å É æ Æ ô ö ò û ù ÿ Ö Ü ¢ £ ¥ ₧ ƒ
á í ó ú ñ Ñ ª º ¿ ⌐ ¬ ½ ¼ ¡ « » ░ ▒ ▓ │ ┤ ╡ ╢ ╖ ╕ ╣ ║ ╗ ╝ ╜ ╛ ┐ └ ┴ ┬ ├ ─ ┼ ╞ ╟
╚ ╔ ╩ ╦ ╠ ═ ╬ ╧ ╨ ╤ ╥ ╙ ╘ ╒ ╓ ╫ ╪ ┘ ┌ █ ▄ ▌ ▐ ▀ α ß Γ π Σ σ µ τ Φ Θ Ω δ ∞ φ ε ∩
≡ ± ≥ ≤ ⌠ ⌡ ÷ ≈ ° ∙ · √ ⁿ ² ■

Press [Enter] Key
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 03 80 * 25 Character Display

This subtest uses 80*25 video resolution to display character codes 20H - 7EH using Mode 03H (80*25). The data displayed is shifted 1 byte to the left for each line as shown below.

```
  80*25 CHARACTER DISPLAY
 01234567890123456789012345678901234567890123456789012345678901234567890123456789
  !”#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmno
!”#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjkl mnop
”#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopq
#$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqr
$%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqrs
%&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqrst
&’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjkl mnopqrstu
’()*=,.-/0123456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdefghIjklmnopqrstuv

               Shifted to the left one letter by one letter.

23456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdef gh I j k l mnopqrst
3456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdef gh I j k l mnopqrst
456789:;⇔?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_’abcdef gh I j k l mnopqrst

  Press [Enter] KEY
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

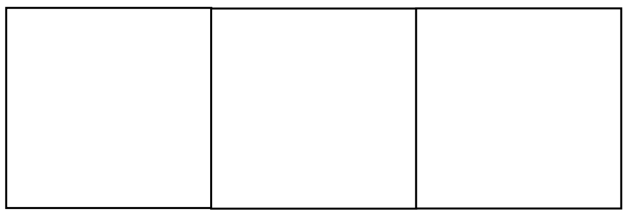
Subtest 04 320 * 200 Character Display

This subtest uses 320*200 video resolution to display green, red and yellow followed by cyan, magenta, and white. The screen below shows the displays when this subtest is executed.

```
320 * 200 GRAPHICS DISPLAY

   COLOR SET 0: [4]

          GREEN          RED          YELLOW
          CYAN         MAGENTA        WHITE
```



Press **ENTER** to display the following sixteen colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white.

```
320*200 GRAPHICS DISPLAY   :   [D]
    BLACK                                D GRAY
    BLUE                                 L BLUE
    GREEN                                L GREEN
    CYAN                                 L CYAN
    RED                                  L RED
    MAGENTA                              L MAGENTA
    BROWN                                YELLOW
    WHITE                                I   WHITE
Press [Enter] KEY
```

Press **ENTER** to display 64 gradations of red, green, blue and white on the screen

```
320*200 GRAPHICS DISPLAY   :   [13]

        64 gradations of red are displayed.

        64 gradations of green are displayed.

        64 gradations of blue are displayed.

        64 gradations of white are displayed.
 Press [Enter] KEY
```

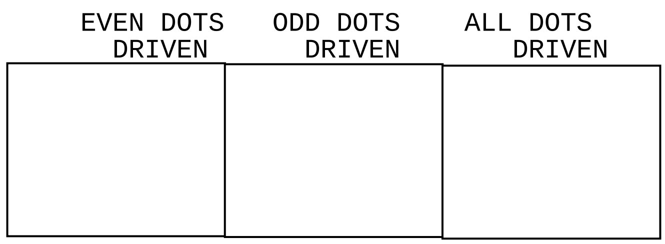
To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 05 640 * 200 Character Display

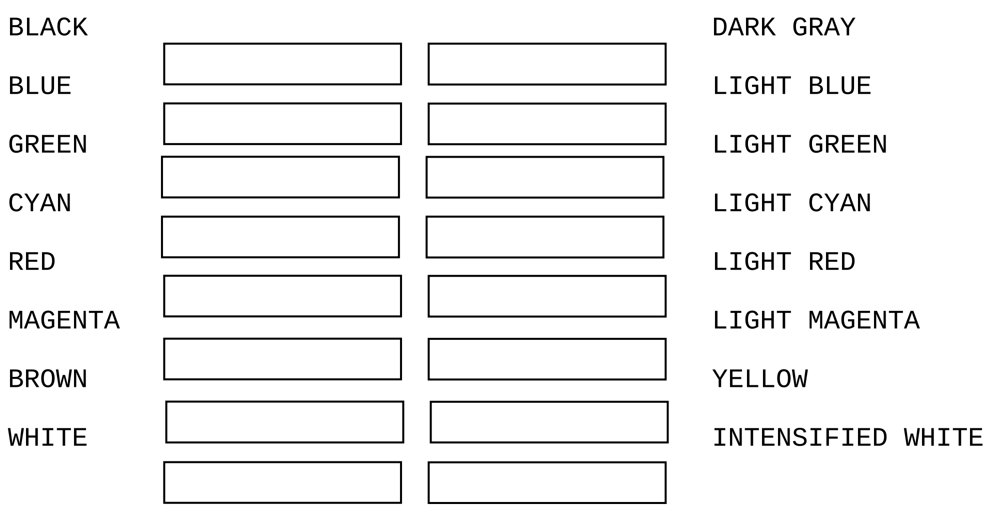
This subtest uses 640*200 video resolutions to display three windows; each window drives a different set of dots: even dots, odd dots and all dots. The screen below displays when this subtest is executed.

```
640 * 200 GRAPHICS DISPLAY: [6]
```



Press **ENTER** to display the following 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white.

```
640*200 GRAPHICS DISPLAY   :   [E]
```




```
Press [Enter] KEY
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 06 640 * 480 Character Display

This subtest uses 640*350 video resolutions to display 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white. The screen below displays when this subtest is executed.

```
640*350 GRAPHICS DISPLAY   :   [10]
    BLACK                                    DARK GRAY
    BLUE                                     LIGHT BLUE
    GREEN                                    LIGHT GREEN
    CYAN                                     LIGHT CYAN
    RED                                      LIGHT RED
    MAGENTA                                  LIGHT MAGENTA
    BROWN                                    YELLOW
    WHITE                                    INTENSIFIED WHITE
Press [Ente
```

Press **ENTER** to display the following 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white using 640*480 video resolutions.

```
640*480 GRAPHICS DISPLAY   :   [12]

    BLACK                               DARK GRAY
    BLUE                                LIGHT BLUE
    GREEN                               LIGHT GREEN
    CYAN                                LIGHT CYAN
    RED                                 LIGHT RED
    MAGENTA                             LIGHT MAGENTA
    BROWN                               YELLOW
    WHITE                               INTENSIFIED WHITE

Press [Enter] KEY
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 07 Display Page

This subtest displays video pages zero through seven.

```
 DISPLAY PAGE 0

000000000000000000000000000000000000000000000000000000000000000
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
0............................................................0
000000000000000000000000000000000000000000000000000000000000000
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 08 "H" Pattern Display

This subtest displays a full screen of "H" patterns.

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 9 Video DAC Register W/R/C

This subtest writes data patterns to the Video DAC register lookup table (PEL Address register), then reads the new data, and compares the result to the original data patterns. The original content of the Video DAC register is saved in RAM and restored after the test is completed.

The test data patterns are 00H, 15H, 2AH and 3FH.

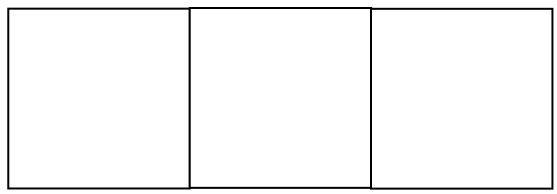
> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter menu, "Screen will remain blank" displays on the screen while the test is executing. When the test is complete the Display Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, "The Screen will remain blank" displays on the screen and then the screen flickers due to the fast screen refresh while the test is executing. Press **Ctrl + break** to return to the Display Test menu.*

Subtest 10 Color Graphics Display

This subtest displays three colors, cyan, white and yellow on the screen as shown below.

```
640 * 480 GRAPHICS DISPLAY

             CYAN        WHITE        YELLOW
```



To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 11 Color Attributes Display

This subtest displays 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white. The screen below displays when this subtest is executed.

```
640*480 COLOR ATTRIBUTE DISPLAY
```

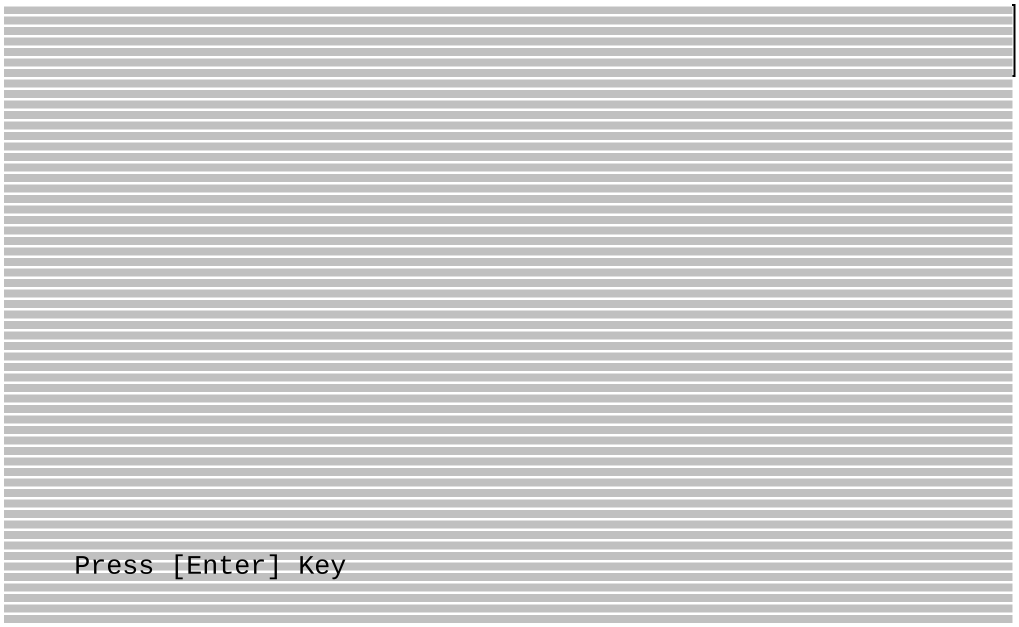
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

```
Press [Enter] Key
```

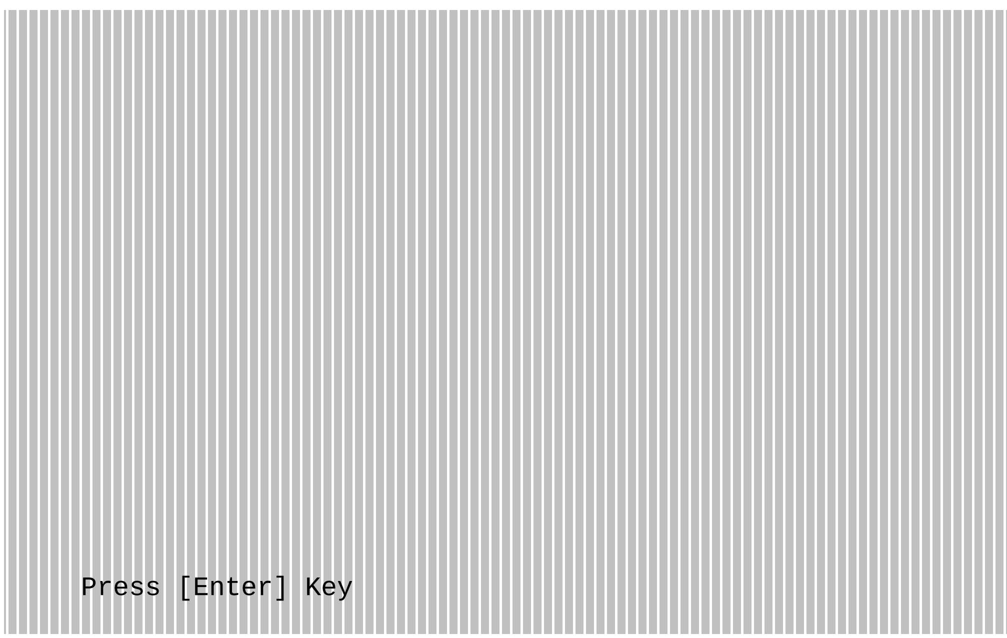
Pressing **Enter** executes VRAM mapping test which indicates vertical lines

Press **Enter** to execute the VRAM mapping test which displays a horizontal line at one dot intervals using Mode 12.

> ***NOTE:*** *The following screen does not display correctly. It will be amended in the next version.*



Press **Enter** to execute the VRAM mapping test which displays a vertical line at four dot intervals using Mode 12.



Press **Enter** to display VRAM mapping test using the all dots Mode.

```
Press [Enter] Key
```

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 12 Color Tiling

This subtest displays black, gray, white, and 3 gradations of red, green, and blue as shown in the following display.

Black	Red	Green	Blue
Gray	Red Gradation	Green Gradation	Blue Gradation
White	Red Gradation	Green Gradation	Blue Gradation

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

3.8 Hard Disk Test

To execute the Hard Disk Test select **06** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Hard Disk Test contains eight subtests that test the functions of the hard disk drive. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTES**: The contents of the hard disk will be erased when subtest 02, 03, 04, 05, 07 or 08 is executed. Before running the test, transfer the contents of the hard disk to other disk.*
>
> *A password is necessary to execute the Hard Disk Test. The password is:* **hard disk**

Subtest 01 Sequential Read

This subtest sequentially reads all the tracks on the HDD starting at track 0. When all tracks have been read, the test starts at the maximum track and reads sequentially back to track 0.

Subtest 02 Address Uniqueness (This subtest need very long time)

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

- Forward sequential
- Reverse sequential
- Random

Subtest 03 Random Address Data

This subtest writes random data to 1000 different random addresses on the HDD. This data is then read and compared to the original data.

Subtest 04 Cross Talk and Peak Shift

This subtest writes eight of the most likely to fail data patterns (shown below) to a cylinder on the HDD, and then reads the data while moving from cylinder to cylinder.

Data Pattern
B5ADADH
4A5252H
EB6DB6H
149249H
63B63BH
9C49C4H
2DB6DBH
D24924H

Subtest 05 Write Specified Address

> ***NOTE:*** *This subtest is designed to run with the Test Loop set to* ***NO****. This subtest is a debug tool and the operator should enter the Test Parameters each time.*

.

This subtest allows you to verify the errors from Subtest 01. It writes specified data to a specified LBA. Use the Log Utilities (see Section 3.18) to specify the LBA number where the error(s) occurred during Subtest 01. The following message displays on the screen to enter the test data, and Sector count.

```
TEST DATA        ??
SECTOR COUNT(01~39)??
START ADDRESS (00000000~MAX Address)?
```

Subtest 06 Read Specified Address

> ***NOTE:*** *This subtest is designed to run with the Test Loop set to* ***NO****. This subtest is a debug tool and the operator should enter the Test Parameters each time.*

This subtest allows you to verify the errors from Subtest 01. It reads specified data (Subtest 06) from a specified LBA. Use the Log Utilities (see Section 3.18) to specify the LBA number where the error(s) occurred during Subtest 01. The following message displays on the screen to enter the test sector count.

```
SECTOR COUNT(01~39)??
START ADDRESS (00000000~MAX Address)?
```

Subtest 07 Sequential Write

This subtest writes specified data to all cylinders on the HDD. The following message displays on the screen to enter the test data.

```
TEST DATA????(=37b3H)
```

Subtest 08 W-R-C Specified Addresses

This subtest writes specified data to a specified sector count, then reads and compares the result. The following message displays on the screen to enter the test data, sector count.

```
TEST DATA   ????(=37b3H)
SECTOR COUNT(01~39)??
START ADDRESS (00000000~Max Address)?
```

3.9 Real Time Clock Test

To execute the Real Time Clock Test select **07** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Real Time Clock Test contains three subtests that test the computer's real time functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Real Time

This subtest allows you to change the date and time. To execute the Real Time Subtest, follow these steps:

1. Select Subtest **01** and the following displays:

```
                    [REAL TIME TEST]
Current date: mm-dd-yyyy
Current time: hh:mm:ss

Enter new date: mm-dd-yyyy
Enter new time: hh:mm:ss


Press [Enter] key to exit test
```

2. If the current date is not correct, enter the correct date at the "Enter new date" prompt and press **Enter**. The following prompt displays:

```
Enter new time:
```

3. If the current time is not correct, enter the correct time using a 24-hour format and press **Enter**.

> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter menu, the Real Time Clock Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the screen above displays and the test is executed again. Press **Ctrl + break** to return to the Real Time Clock Test menu.*

Subtest 02 Backup Memory

This subtest writes 50 bytes of test data (FFH, AAH, 55H, and 00H) to the CMOS 14th address, then reads the new data and compares it to the original data.

Subtest 03 Real Time Carry

> ***CAUTION**: When this subtest is executed, the current date and time are reset.*

This subtest checks the clock's carry function.

```
                    [REAL TIME CARRY TEST]
  Current date: 12-31-1999
  Current time: 23:59:55

Press [Enter] key to exit test
```

The following is the display after the date carry function is executed.

```
                    [REAL TIME CARRY TEST]
  Current date: 01-01-2000
  Current time: 00:00:01

Press [Enter] key to exit test
```

To exit this subtest and return to the Real Time Clock menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

3.10 Cache Memory Test

To execute the Cache Memory Test select **08** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Cache Memory Test contains eight subtests that test the computer's cache memory. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE****: If* ***NO*** *is selected for Test Loop on the Test Parameter menu, the screen will remain blank while the subtest is executing. When the test is complete the Cache Memory Test menu displays.*
>
> *If* ***YES*** *is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the subtest is executing. Press* ***Ctrl + break*** *to return to the Cache Memory Test menu.*

Subtest 01 Constant Data Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes constant data (FFFFH, AAAAH, 5555H, 0101H, 0000H), reads the new data and compares the result with the original data pattern. The original cache memory content is then restored to the cache memory.

Subtest 02 Address Pattern Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes address data patterns (0000H, 0001H, 0002H, through 3FFDH, 3FFEH, 3FFFH), reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 03 Increment/Decrement Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the increment data (00H, 01H, 02H, through FDH, FEH, FFH), reads the new data and compares the result with the original data. After comparing the incremental data, decrement data (FFH, FEH, FEH, through 02H, 01H, 00H) is written and the new data is read and compared with the original data. The original cache memory content is then restored to the cache memory.

Subtest 04 Bit Shift Pattern Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the bit shift data patterns (1 bit shifted every 4 bytes), reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 05 Write Disturb Test (We can't support this time)

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "write disturb data," reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 06 Checker Board Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "checker board data," (data which is inverted front/back and left/right) reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 07 Marching Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "marching data," (00H through 01H and 01H through 00H) reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 08 Working Data Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "working data," reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

3.11 High Resolution Display Test

To execute the High Resolution Display Test select **09** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The High Resolution Display Test contains six subtests that test the computer's high resolution video display. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM W/R/C Test

This subtest writes address and data patterns to Video RAM, then reads the values from the Video RAM and compares them to the original test patterns. During the execution of this test 13 different color screens display: black, green, green, blue, blue, red, red, red, black, white, pink, cyan, and black.

Test Process:

1. Sets the video display to 1024*768 mode

2. Bank change test
   Writes 1 byte data in order 0, 1, through Fh, and compares the result, at every bank, to the original data patterns.

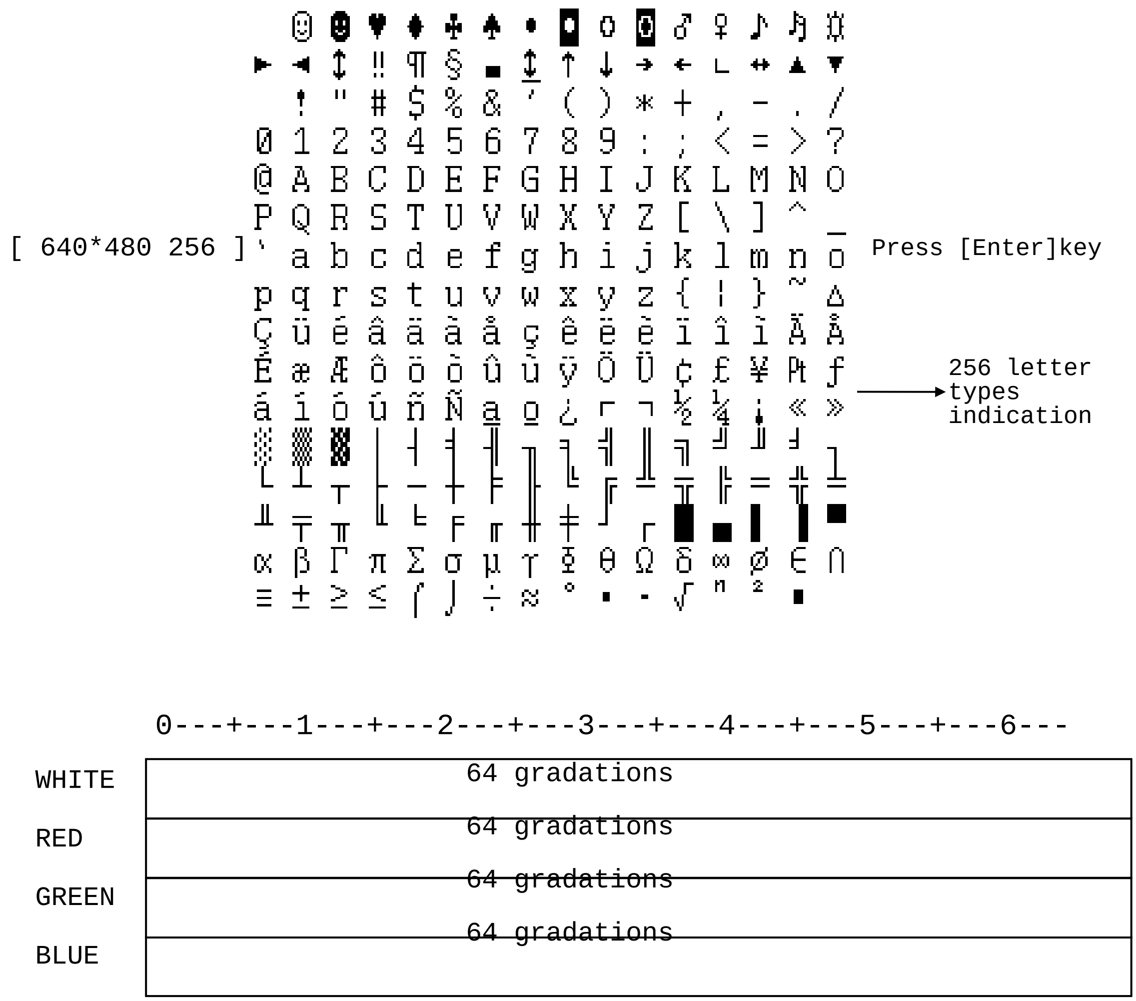
3. Bit shift data test
   Writes 01h data into addresses A000:0000h through A000:FFFFh for each bank, reads the new data and, then compares the results with the original data. Data is then shifted 1 bit to the left, and all bits (01h, 02h, 04h, 08h, through 80h) are tested again.

4. Fixed data test
   Writes test data (in order FFh, AAh, 55h, 00h) into addresses A000:0000h through A000:FFFFh for each bank by, reads the new data and, then compares the results with the original data. Data is then shifted 1 bit to the left, and all bits are tested again

> ***NOTE:*** *If **NO** is selected for Test Loop on the Test Parameter menu, the screen displays the colors listed above and then the High Resolution Display Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the screen displays the colors listed above. Press **Ctrl + break** to return to the High Resolution Display Test menu.*

Subtest 02 640*480 Mode Display

This subtest uses 640*480 video resolutions to display a high resolution white frame, 256 letter types (8*16 pixels) and 64 gradations of white, red, green, and blue as shown below.

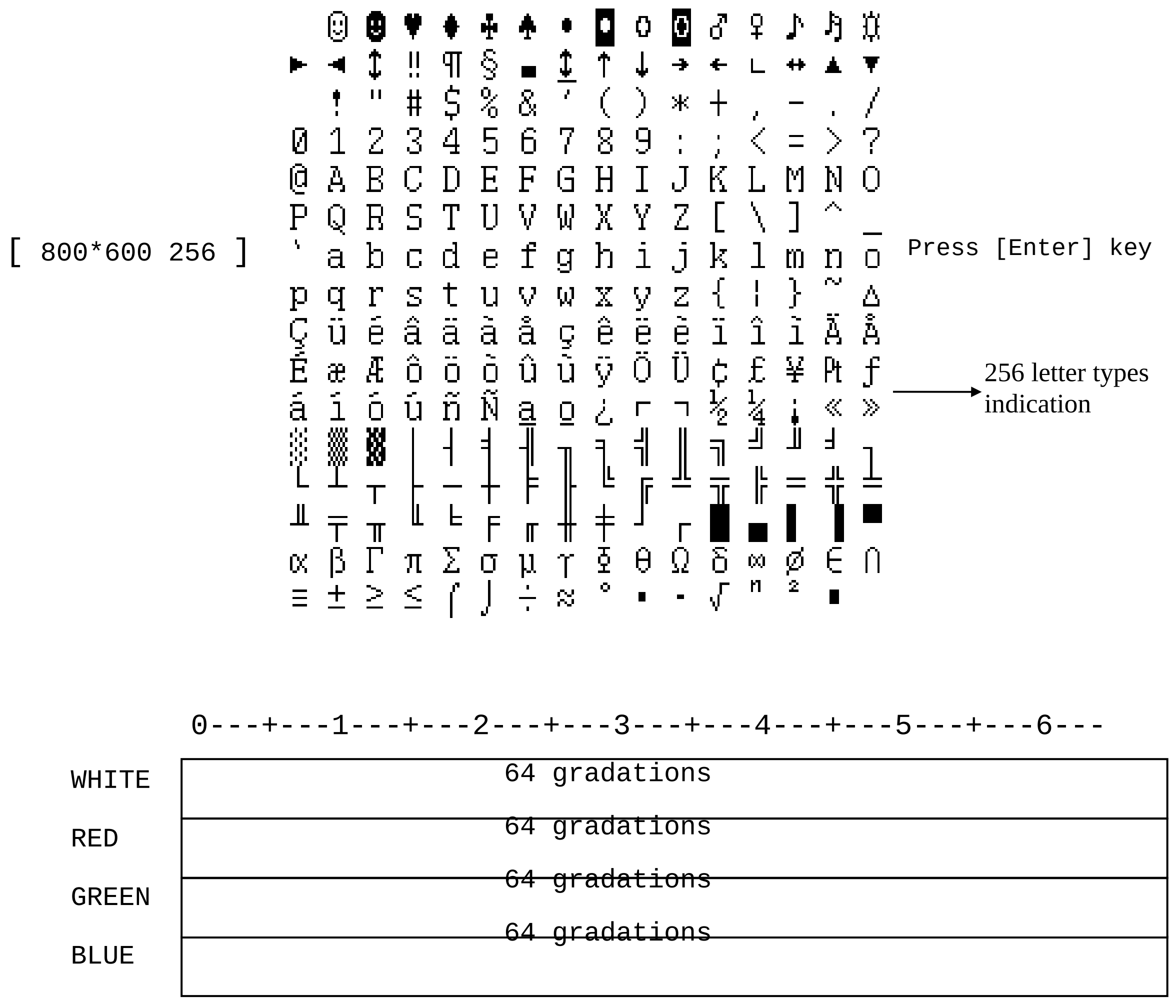


To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 03 800 * 600 Mode Display

This subtest uses 800*600 video resolutions to display a high resolution white frame, 256 letter types (8*16 pixels) and 256 gradations of white, red, green, and blue as shown below.

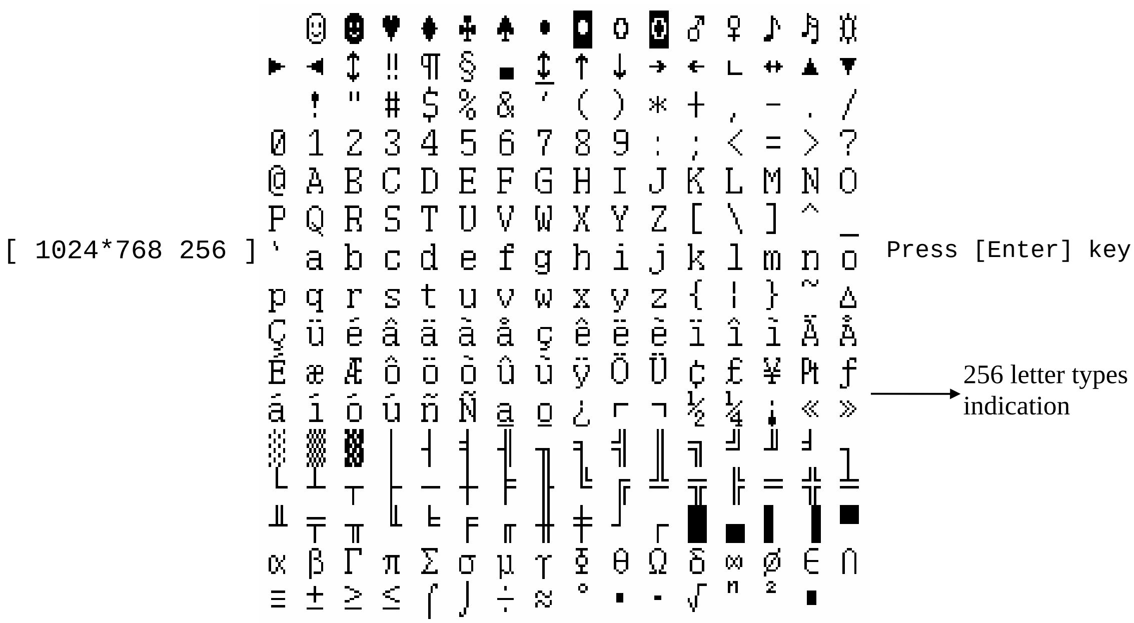


To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** was selected for *Test Loop* on the Test Parameter Menu

Subtest 04 1024* 768 Mode Display

This subtest uses 1024*768 video resolutions to display a high resolution white frame, 256 letter types (8*16 pixels) and 64 gradations of white, red, green, and blue as shown below.




```
0---+---1---+---2---+---3---+---4---+---5---+---6---
```

WHITE	64 gradations
RED	64 gradations
GREEN	64 gradations
BLUE	64 gradations

To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu. Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 05 “H” Pattern Display

This subtest uses the 1024*768 Mode to display a high resolution white frame, “H” letters (8*16 pixels fonts), at 128 letters by 48 lines.

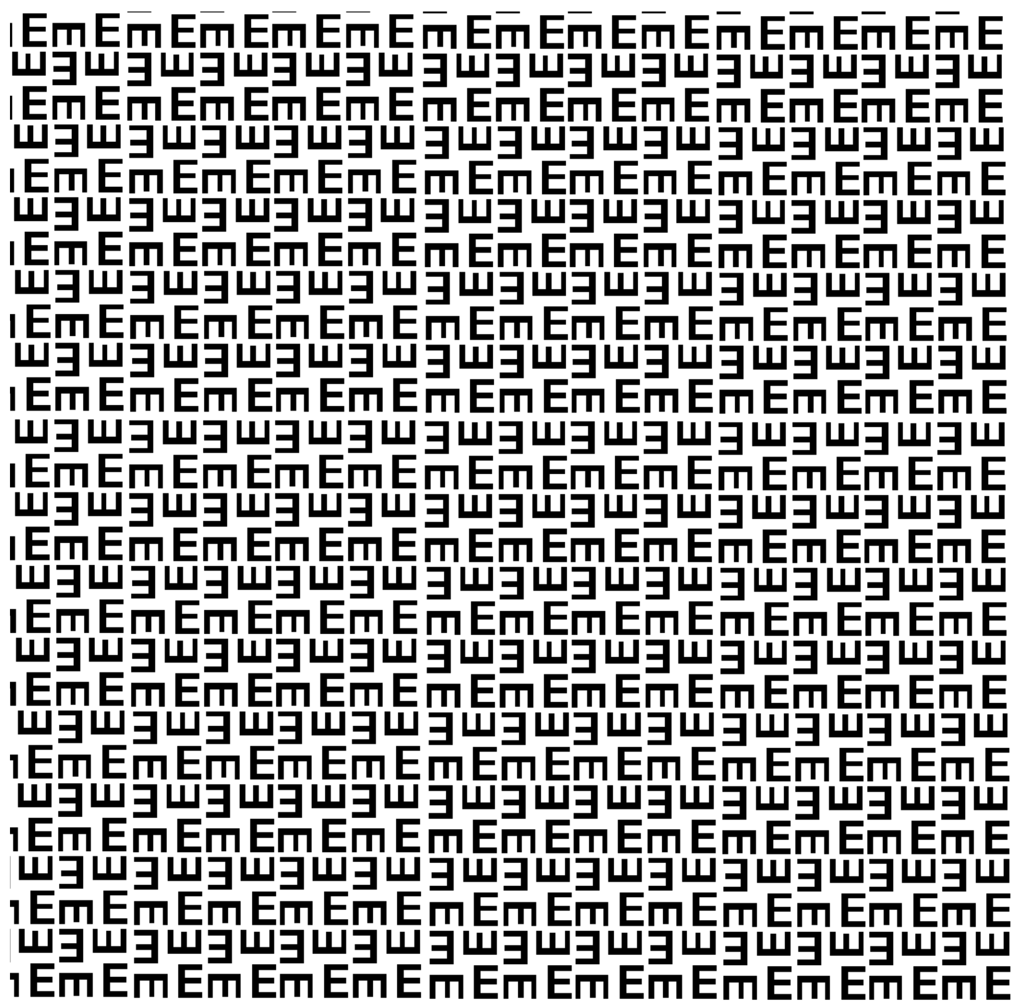
```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

Subtest 06 Focus Test (“E” Pattern)

This subtest sets the 1024*768 Mode and displays “E” patterns (18*18 dot fonts), at 56 letters *42 lines surrounded by a high resolution white frame.



To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.
Press **Ctrl** + **break** if **YES** were selected for *Test Loop* on the Test Parameter Menu.

3.12 Multimedia Test

To execute the Multimedia Test select **10** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Multimedia Test contains four subtests that test the computer's multimedia functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE**: Use the Toshiba Backup CD-ROM for Subtests 01, 02, and 03.*
>
> *Because CDROM driver issue, the Multimedia function can't test, this is limitation.*

Subtest 01 Sequential Read Test

This subtest sequentially reads one block unit (2K bytes) of all logical addresses from the test CD.

> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter Menu, the screen will remain blank while the subtest is executing. When the test is complete the Multimedia Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter Menu, the Test Status screen displays while the subtest is executing. Press **Ctrl + break** to return to the Multimedia Test menu.*

Subtest 02 Random Read Test

This subtest randomly reads all addresses.

Subtest 03 Read Specified Address Test

This subtest reads data from a specified block of addresses.

The following message displays on the screen to enter the start and end block addresses:

```
START BLOCK ADDRESS?
END BLOCK ADDRESS   ?
```

Subtest 04 1 Point W/R/C (R/RW Media)

> ***NOTE**: Use CD-R or CD-RW, the CD-ROM and DVD cannot be used for this subtest, and some DVD-dual can't support this test.*

This subtest writes specified data to a specified block count, then reads and compares the result.

3.13 MEMORY2 Test

To execute the Expansion Test select **11** from the Diagnostic Test Menu, press **Enter** and Follow the directions on the screen. The MEMORY2 Test contains four subtests that test the computer's. Move the highlight bar to the subtest you want to execute and press **Enter**.

> ***NOTE**: If **NO** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. When the test is complete the Memory Test menu displays.*
>
> *If **YES** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. Press **Ctrl + break** to return to the Memory Test menu*

Subtest 01 All one/All zero test

This subtest performs pseudorandom data read/write. The data consists of "all ones"/"all zero" patterns produced by pseudorandom sequence generator. The test checks address error.

```
FFFFFFFFFFFFFFFF0000000000000000
0000000000000000FFFFFFFFFFFFFFFF
```

Subtest 02 Walking 1/Walking 0 test (Left)

This subtest uses "running one"/"running zero" patterns. This test sequence allows also to checking system bus in maximum noise conditions. The following test sequence is written.

```
7FFF7FFF7FFF7FFF8000800080008000
BFFFBFFFBFFFBFFF4000400040004000
```

After all the memory being tested is filled with the pattern, it is read in descanting direction and compared with reference data. As the memory is read, the data is replaced with inverse test pattern. After all the memory is read and replaced with inverted pattern, it is read in descanting direction and compare with new reference data. As the memory is read, the data is replaced with next pattern, which is like first one shifted to right.

Subtest 03 Walking 1/Walking 0 test (Right)

Tee test method is the same as Subtest2. However, the data to be used differs.

```
80008000800080007FFF7FFF7FFF7FFF
4000400040004000BFFFBFFFBFFFBFFF
```

Subtest 04 Walking 1/Walking 0 test (Left/ Right)

Tee test method is the same as Subtest2. However, the data to be used differs.

```
7FFF7FFF7FFF7FFF8000800080008000
BFFFBFFFBFFFBFFF4000400040004000
DFFFDFFFDFFFDFFF2000200020002000


FFFBFFFBFFFBFFFB0004000400040004
FFFDFFFDFFFDFFFD0002000200020002
FFFEFFFEFFFEFFFE0001000100010001
80008000800080007FFF7FFF7FFF7FFF
4000400040004000BFFFBFFFBFFFBFFF


0004000400040004FFFBFFFBFFFBFFFB
0002000200020002FFFDFFFDFFFDFFFD
0001000100010001FFFEFFFEFFFEFFFE
```

3.14 Error Codes and Error Status Names

The following table lists the error codes and error status names for the Diagnostic Tests.

Device Name	Error Code	Error Status Name
(Common)	FF	Data Compare Error
Memory	02	Protected Mode Not Changed
	??	Other Error
FDD	01	Bad Command Error
	02	Address Mark Not Found
	03	Write Protected
	04	Record Not Found
	06	Media Change Line Error
	08	DMA Overrun Error
	09	DMA Boundary Error
	0C	Select Media Error
	10	CRC Error
	20	FDC Error
	40	Seek Error
	80	Time Out Error
	??	Other Error
HDD	01	Bad Command Error
	02	Bad Address Mark Error
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enabled
	20	HDC Error
	40	Seek Error
	80	Time Out Error
	AA	Drive Not Ready

Table 3-15-1 Error codes and error status names (1/2)

Device Name	Error Code	Error Status Name
HDD	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
	F0	No Sense Error
	??	Other Error
Cache Memory	02	Protect Mode Error
	03	Caching Error
	??	Other Error
Multimedia	01	Write Error
	0F	Invalid Drive
	15	Drive Not Ready
	??	Other Error

Table 3-15-1 Error codes and error status names (2/2)

NOTE: *If error status name is* ***Other Error****, please reference the* ***Error Code*** *for error information*

3.15 Running Test

***NOTES**:*

1. *You may add or delete subtests using the Running Test Edit Item function, see Section 3.20.*
2. *Do not forget to insert a work disk in the FDD. If a work disk is not inserted an error will be generated during the Floppy Disk Test.*
3. *If the test completes successfully a "PASS" sign with blue letters displays on the screen.*
4. *If the test fails or is interrupted before completion an "FAIL" sign with red letters displays on the screen.*
5. *If running item not select an "NOITEM" sign with green letters display on the screen.*
6. *All errors which occur during execution of the Running Test are logged in the Log File.*
7. *This program is executed according to the* Count Loop *number selected in the Running Test Edit Item, see Section 3.20. To terminate the program, press* ***Ctrl + Break.***

3.16 DMI INFOEMATION

Select **03** from the Diagnostics Menu and press **Enter** to Check or Write DMI Information Data:

3.16.1 Check DMI Information

The Check DMI Configuration program contains the following configuration information for the computer:

> ***NOTE:*** *Please set the media of DVD before starting a test.*
> *AHCI cannot control under the FREE-DOS*

System information (Type 1)

1. Manufacture : TOSHIBA
2. Product Name : Satellite XXXXXX
3. Version :(TOSHIBA Part Number)
4. Serial Number : Serial Number
5. UUID Number: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

OEM Strings (Type 11)

1. OEM String : xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

On Board LAN MAC

1. MAC ADR: xxxxxxxxxxxx

DVD Region Code

1. User Change Time : X
2. Region Code : X

3.16.2 Write DMI Information

The Write DMI Information program contains the following information for the computer:

1. Manufacture Name (TOSHIBA)
2. Product Name (Satellite XXXXXX)
3. Part Number (PSP50X-XXXXXX)
4. Serial Number (12345678W)
5. OEM String (PSP50X-XXXXX,SXXXXXXXXXX)
6. Model Select [1]Dyn-Jpn [2]Tos-Jpn [3]Tos-Eng [4]Tos-FR
7. Write UUID (XXXXXXXXXXXXXXXXX)
8. Brightness Write (XXXXXXXX)

a. SLP2.0 Build Sig [1]Non OS [2]OS
b. Wireless LAN ID (001E4CXXXXXX)

c. AC Adapter Select [1]65W [2]75W [3]95W [4]120W

Select 1 ~ c to key in new data , select 0 to exit program , program will compare input data length with the max length , if over will retry key in

Note: Please Check New DMI Information After System Restart!! V3.1

1. **** Manufacture Name (TOSHIBA) - (32)
2. **** Product Name (Satellite XXXXXX) - (32)
3. **** Part Number (PSP50X-XXXXXX) - (26)
4. **** Serial Number (12345678W) - (32)
5. **** OEM String (PSP50X-XXXXX,SXXXXXXXXXX) - (64)
6. **** Model Select [1]Dyn-Jpn [2]Tos-Jpn [3]Tos-Eng [4]Tos-FR – (2)
7. **** Write UUID (XXXXXXXXXXXXXXXX) – (16)
8. **** Brightness Write (XXXXXXXX) – (8)

a. **** SLP2.0 Build Sig [1] Non OS [2] OS-(2)
b. **** Wireless LAN ID (001E4CXXXXXX) – (12)
c. **** AC Adapter Select [1]65W [2]75W [3]95W [4]120W – (1)
0. **** Exit

Please Select (1 ~ c) To Modify DMI String:

Current Data of EEPROM: Toshiba
1. Enter the Manufacture Name: TOSHIBA
Your Key in is : TOSHIBA …… This is your key in data
EEPROM return: TOSHIBA ……. This is read from eeprom back

Press any key to continue
Note: Please Check New DMI Information After System Restart!!

If Key in length too long will retry:

Current Data of EEPROM: 12345678WU
4. Enter the Serial Number: 12345678901234
Your Key in String Length Not Correct 14 > 10!!!

Current Data of EEPROM: 12345678WU
4. Enter the Serial Number:

NOTE: *The SLP2.0 is Microsoft SPEC, call "System Locked Pre-Installation"or"SLP",*

It is for OEM pre install Windows and no need to Active, If you select Non OS , then you need to Active your OS before you use .

3.17 Log Utilities

This function logs error information generated while a test is in progress and stores the results in RAM (Maximum error log: 500 times). This function can store data on a floppy disk. If the power switch is turned off, the error information will be lost. Error information is displayed in the following order:

1. Error count (CNT)
2. Test name and subtest number (TEST)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. Error Name (ERROR NAME/DETAILS)

3.17.1 Operations

1. Select **04** and press **Enter** in the Diagnostics Menu to log error information into RAM or onto a floppy disk. Error information is displayed in the following format:

```
                 XXXX ERRORS        PASSCOUNT = XXXX

CNT   TEST       PASS   STS   ADDR       WD   RD   ERROR NAME/DETAILS
001   FDD 02     0000   180   0000001    00   00   WRITE PROTECTED
002   FDD 01     0000   120   0000001    00   00   TIME OUT ERROR
 |     |    |    |      |      |          |    |          |
 |     |    |    |      |     Address     |    |          |
 |     |    |    |     Error Status       |    |          |
 |     |    |   Pass Count                |    |          |
 |     |   Subtest Number                 |   Read Data   |
 |    Test Name                          Write Data       |
Error Count                                          Error Name and Detail
[[1:Next, 2:Prev, 3:Exit, 4;Clear, 5:FD Log Read, 6:FD Log Write, 7:Log Save]]
```

2. Error information displayed on the screen can be manipulated with the following number keys:

   The **1** key scrolls the display to the next page.
   The **2** key scrolls the display to the previous page.
   The **3** key returns to the Diagnostics Menu.
   The **4** key erases all error log information in RAM.
   The **5** key reads the log information from a floppy disk.
   The **6** key writes the log information to a floppy disk.
   The **7** key save the log information to a floppy disk.

The following are the test abbreviations for each Diagnostics Test.

Test Name	**Test Abbreviations**
System Test	ROM
Memory Test	RAM
Keyboard Test	KBD
Display Test	CRT
Floppy Disk Test	FDD
Hard Disk Test	HDD
Real Time Clock Test	RTM
Cache Memory Test	CAH
Height Resolution Display Test	KIF
Multimedia Test	MLT
Memory2 Test	RAM

3.18 System Configuration

Select **05** from the Diagnostics Menu and press **Enter** to display the following system configuration:

```
  SYSTEM CONFIGURATION:

     * - BIOS VER = VX.XX  KBC VER = XXXX
     * - MAC ADDRESS: XXXXXXXXXXXX
     * - 0 ASYNC ADAPTER
     * - 1 HDD DRIVE(S):XXXXXXXXXXXXXXXXXXXXXXXXXX
                FW Rev.:XXXXXXXX
                CUR LBA:XXXXXXXX  ORG LBA:XXXXXXXX
     * - BATTERY TYPE:XXXXXXXXXX
     * - XXXMB MEMORY SIZE
     * - XXX CPU
     * - 1 Vedio Chip XXXXXXXXXXXXX
     * - 1 ODD DRIVE(S):XXXXXXXX
                   FW Rev.:XXXX
```

Press **Enter** to return to the Diagnostics Menu.

3.19 Running Test Edit Item

3.19.1 Function Description

Function description lets you add or delete the subtests used to execute the Running Test. The following screen displays after pressing the **Tab** key to edit an item in the Running Test.

```
KEY OPERATION

↓     Cursor Down
↑     Cursor Up
PgDn  Page Down
PgUp  Page Up
Home  Top of ITEM
End   End of ITEM
Ins   Insert ITEM
Del   Delete ITEM
Enter End
```

3.19.2 Operation Description

Select **05** from the Diagnostics Menu and press **Enter** to display the following:

```
                            Test Item Editor                [RUNNING TEST]

Loop Count (1-65535, 0 = infinity) [00000]           Error Stop [ NO ]

T-No       Test Name              S-No         Subtest Name
01         System Test            Subtest 01   ROM Checksum
02         Memory Test            Subtest 01   Conventional Memory
02         Memory Test            Subtest 02   Protect Mode
02         Memory Test            Subtest 03   Protect Mode (32MB Max)
02         Memory Test            Subtest 04   RAM Refresh
04         Display Test           Subtest 01   VRAM W/R/C
04         Display Test           Subtest 02   Character Attribute Set
04         Display Test           Subtest 03   Character Set
04         Display Test           Subtest 04   80 * 25 Character Display
04         Display Test           Subtest 05   320 * 200 Graphics Display
04         Display Test           Subtest 06   640 * 200 Graphics Display
04         Display Test           Subtest 07   640 * 480 Graphics Display
04         Display Test           Subtest 08   Display Page
05         Floppy Disk Test       Subtest 02   Sequential W/R/C
08         Hard Disk Test         Subtest 01   Sequential Read
08         Real Time Clock Test   Subtest 02   Backup Memory Test

                         Tab: HELP (Key Operation)
```

1. Enter a **number** or **0** for **Loop Count** and press **Enter**.

Select a number from 1 to 65535 to define the number of times the Running Test executes.
Select 0 to run the test continuously until halted by the user.

2. Select the **NO** or **YES** for **Error Stop** and press **Enter**.

   Select **NO** to keep the test running even if an error is found.
   Select **YES** to stop the test program when an error is found.

> ***NOTE:*** *All errors which occur during execution of the Running Test are logged in the Log File.*

3. Press **Insert** to add a subtest.

4. Press **Delete** to remove the selected subtest.

5. Press **Enter** when you have finished editing the Running Test list.

6. The following message displays:

```
Do you want to save the data?

   Save to disk
   Do not save
```

7. Select the option and press **Enter**.

8. Select **03** from the Diagnostics Menu and press **Enter** to execute the Running Test.

> ***NOTE:*** *If press **Ctrl+break** in the run-in process, please press more one any key to exit.*

3.20 Common Tests and Operation

3.20.1 How to operate a window

To input parameters, or open a window use the following keys.

↑ ↓ → ← key	: to move a highlight bar
[Enter] key	: to select an item at the highlight bar
[Esc] key	: to close the current window and go back to the previous window

3.20.2 How to Stop the Test Program

To stop a test:

[**Ctrl**]+ [**Break**] Press the Ctrl key and the Break key simultaneously.

3.20.3 Test Status Screen

> ***NOTE**: The Test Status Screen does not display during all the tests. See the specific test description Sections 3.4 through 3.14.*

The following Test Status screen displays during most tests. See the description of each test Sections 3.4 through 3.14 for specific screen information.

```
      Test Name

Sub Test     :0101
Pass Count   :00000      Error Count   :00000
Write Data   :00         Read Data     :00
Address      :00000000   Status        :00
```

Test Name — Displays the name of the test being executed.

Subtest No. — Displays the Subtest number in the following format:

ffgg
- ff = Subtest No.
- gg = Step Number (Will be blank if the test does not have a Step Number.)

Pass Count	Displays the number of times the test has been executed.
Error Count	Displays the number of errors which have occurred during the test.
Write Data	Displays only the test data that has failed to compare during the test while being written during the test.
Read Data	Displays test data that has failed to compare during the test while being read during the test.
Test Address	Displays the Test Address. (The format differs for each test.)
Error Status	Displays the error status.
Error Name	Displays the name of the error.

3.20.4 Test Stop Display

If an error occurs during a Subtest and YES is selected for Error Stop, the following message displays:

```
[HALT OPERATION]

    1.Test end
    2.Continue
    3.Retry
```

* Select 1, 2, or 3

The three selections have the following functions:
1: Terminates the test program and exits to the subtest menu.
2: Continues the test from the error.
3: Restarts the test from the beginning.

Use the arrow keys to move the cursor to the desired option and press Enter.

3.20.5 How to enter data

Letters which must be entered are always shown in [ ]. Simultaneous entries are displayed by a “+” mark. For example:

[a] [Enter]
Press the “a” key, and then press the [Enter] key.

[Ctrl] + [c]
Press the [Ctrl] key and the “c” key simultaneously.

Chapter 4

Replacement Procedures

Chapter 4 Contents

Figures

4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

The tilt stand, if it is installed, can be removed without any other FRUs removed.

<table>
<tr><td colspan="5">4.2 Battery Pack</td></tr>
<tr><td colspan="5">4.3 HDD</td></tr>
<tr><td colspan="5">4.4 Memory Module</td></tr>
<tr><td colspan="5">4.5 Keyboard</td></tr>
<tr><td colspan="5">4.9 TOP Cover Assembly</td></tr>
<tr><td>4.10 Touch Pad</td><td>4.17 Speaker Box</td><td>4.6 Wireless LAN Card and BT module</td><td>4.7 3G module card</td><td>4.8 Display Assembly</td></tr>
<tr><td colspan="2"></td><td colspan="2">4.11 I/O Boards</td><td>4.14 LCD unit</td></tr>
<tr><td colspan="2"></td><td colspan="2">4.12 System Board</td><td>4.15 WEB Camera module</td></tr>
<tr><td colspan="2"></td><td colspan="2">4.13 CPU Heat Sink</td><td></td></tr>
<tr><td colspan="2"></td><td colspan="2">4.16 Application for Thermal grease on CPU and North Bridge</td><td></td></tr>
</table>

• Chart Notation

The chart shows the case for the following example:

• Removing a LCD unit

All FRUs down to the “4.2 Battery pack”to”4.5 Keyboard” and “4.9 Top Cover Assembly” and “4.8 Display Assembly” above LCD unit must be removed.

Safety Precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

DANGER:

1. *In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion.*
   Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.
2. *Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.*

WARNING:

1. *To prevent electric shock, turn off the power unplug the AC adapter from the power source.*
2. *As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.*
3. *Take care not to injury yourself on any edges or corners.*

CAUTION:

1. *Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.*
2. *To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screws. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.*
3. *To prevent electric shock, check that you have disconnected all cables from a part before removing the part.*
4. *When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.*
5. *To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.*

Before You Begin

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2 Battery Pack”.

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
    - Dust or dirt
    - Static electricity
    - Extremely hot, cold or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and reassembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly Procedure

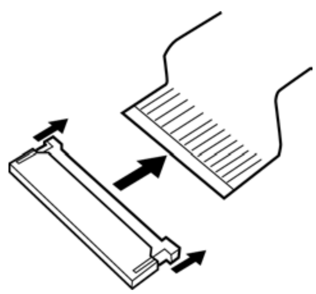
Three main types of cable connector are used.

- Pressure plate connector
- Spring connector
- Normal pin connector

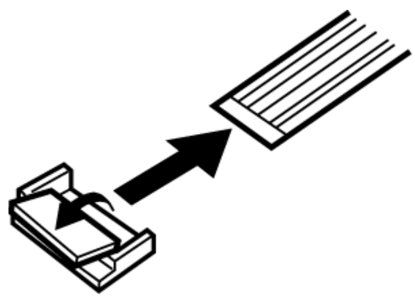
When disconnecting a pressure plate connector, lift up the tag on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, lift up the pressure plate to a suitable height and insert the cable into the connector. Press down on both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you lift the pressure plate high enough to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector



Spring connector

Assembly Procedure

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected;
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring

Screw Tightening Torque

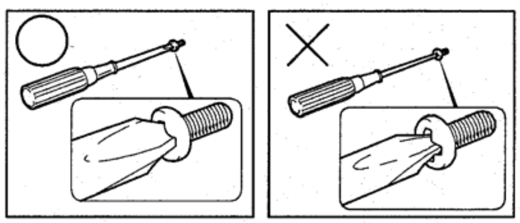
Use the following torque when tightening screws.

> ***CAUTION**: Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.*

> ***NOTE**: To tighten screws quickly and accurately, an electric screwdriver is recommended.*

- M2 (2mm) 0.167 N· m (1.7 kgf· cm)
- M2.5 (2.5mm) 0.392 N· m(4.0 kgf· cm) for Hinge support

> ***NOTE:** To prevent damage to THIN HEAD screws, press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*



Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue



"Special length screw" means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.8 mm and so on.

Screw Notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths are indicated on the computer body.

Format:

Screw shape + Screw length (mm)

Screw shape

B: Bind screw
F: Thin head screw
S: Super thin head screw
T: Tapping screw
U: Other screws (Unique screws: pan head, stud, etc.)

Example: B6 … 6mm bind screw

4.2 Battery pack

Removing the battery pack

The following describes the procedure for removing the battery pack (See Figure 4-2-1).

> ***CAUTION:*** *Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.*

1. Turn off the power of the computer.

2. Disconnect the AC adapter and all external devices from the computer.

3. Turn the computer upside down.

4. Slide and hold the battery release latch (2) to free the battery pack after moving the battery release latch (1) into it unlock position – pick the battery pack out of the computer from fillister.

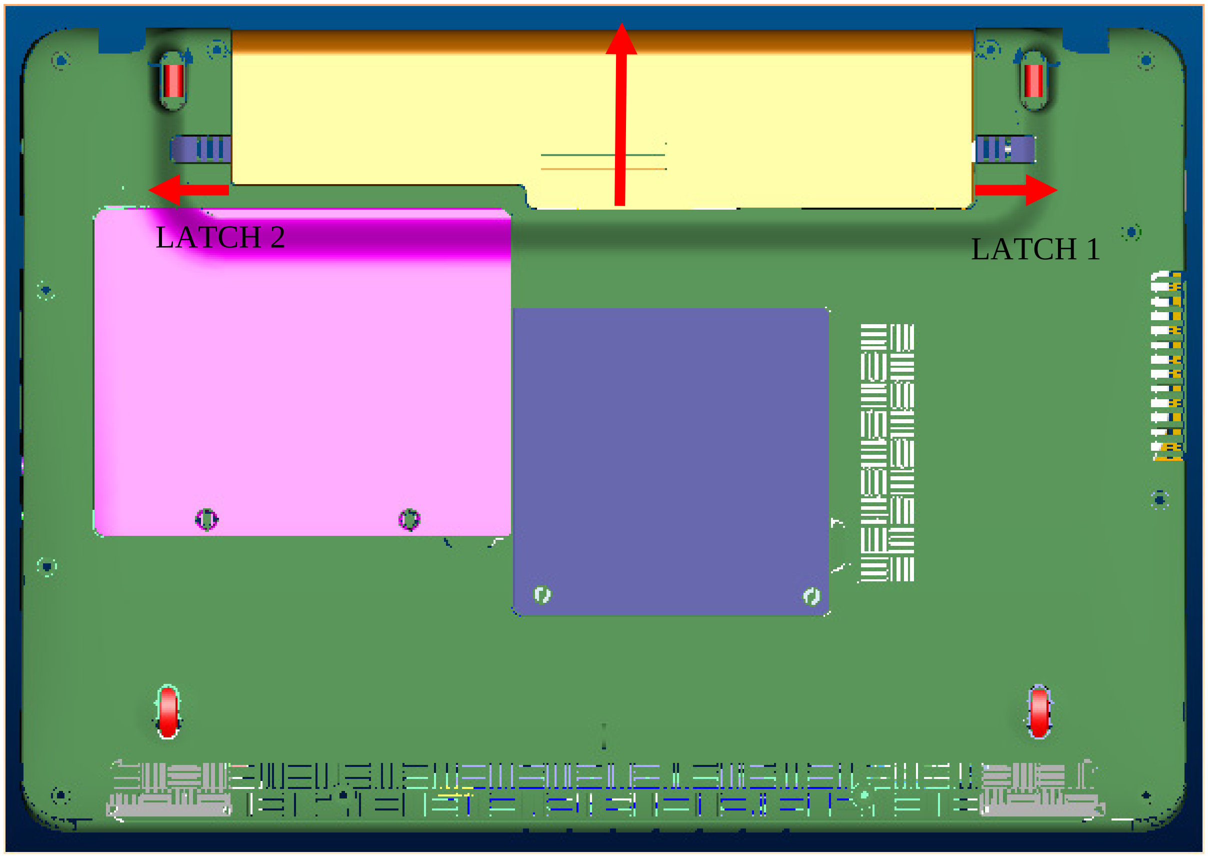


Figure 4-2-1 Remove the battery pack

NOTE: *Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.*

Installing the battery pack

The following describes the procedure for installing the battery pack (See Figure 4-2-2).

CAUTION: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

NOTE: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.

3. Attach the **battery cover** to the **battery pack**.
4. Insert the battery pack
5. Ensure the battery release latch (2) is moved into its locked position

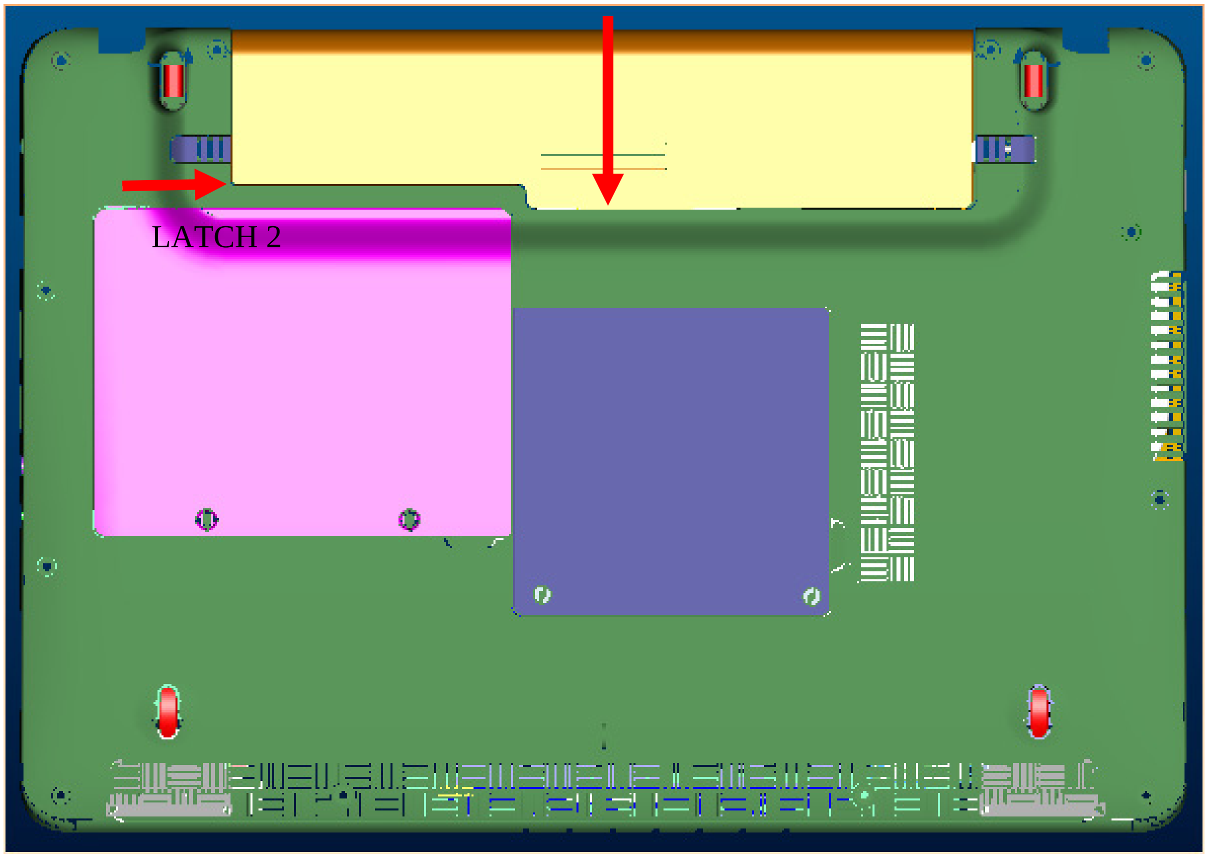


Figure 4-2-2 Install the battery pack

4.3 HDD

Removing a HDD-H9.5mm

The following describes the procedure for removing the HDD (See Figure 4-3-1 to 4-3-3).

CAUTION:	*Take care not to press on the top or bottom of a HDD. Pressure may cause data loss or damage to the device.*

1. Turn the computer upside down.
2. Remove the following **screws** with a T6 –bit TORX securing a HDD slot cover and remove a **HDD slot cover**.
   - M2.0×4.0B FPH(T6) screw x2
3. Remove the following **screws** securing the **HDD assembly**.
   - M2.0×3.0B FLAT BIND screw x2
4. Disconnect the **HDD assembly** from the connector on the system board**.**

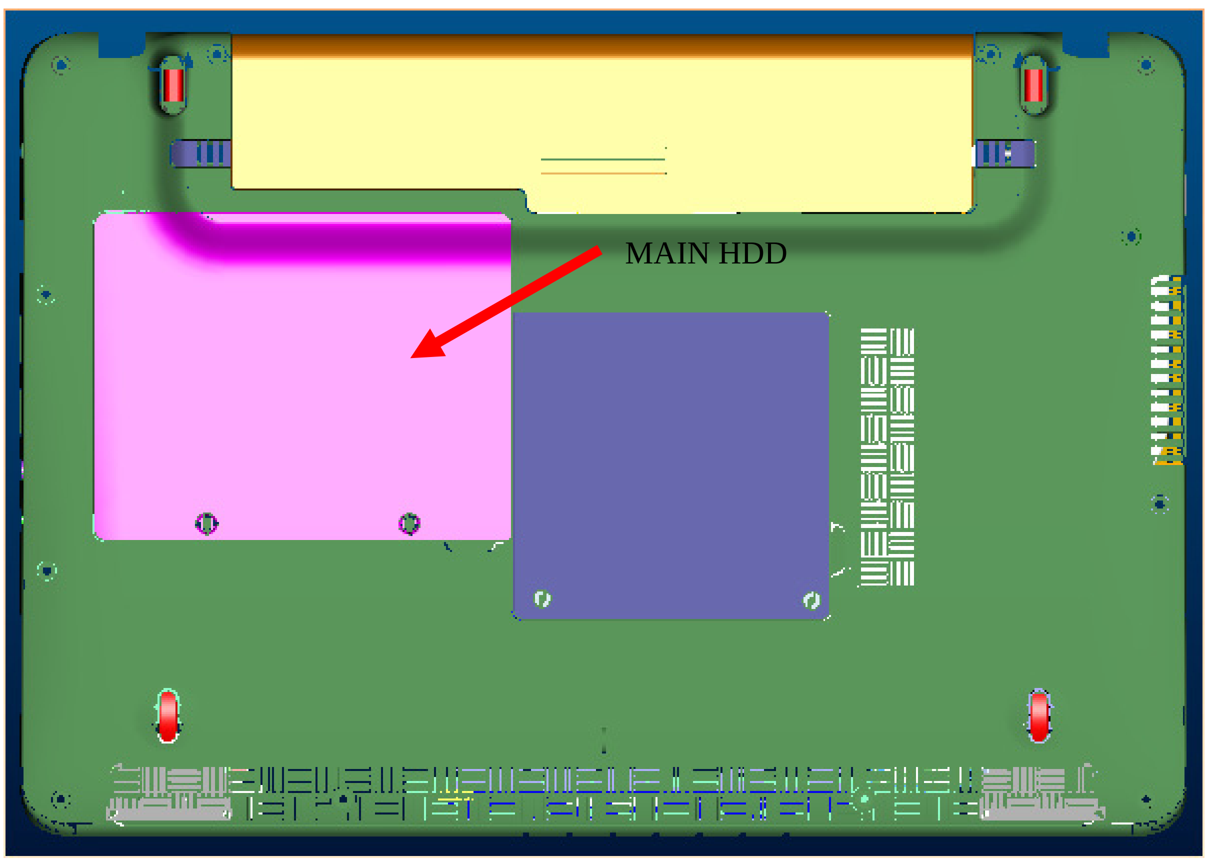


Figure 4-3-1 Turn the computer upside down

CAUTION:	*When a HDD is installed, they are installed in the position as the following figure.*

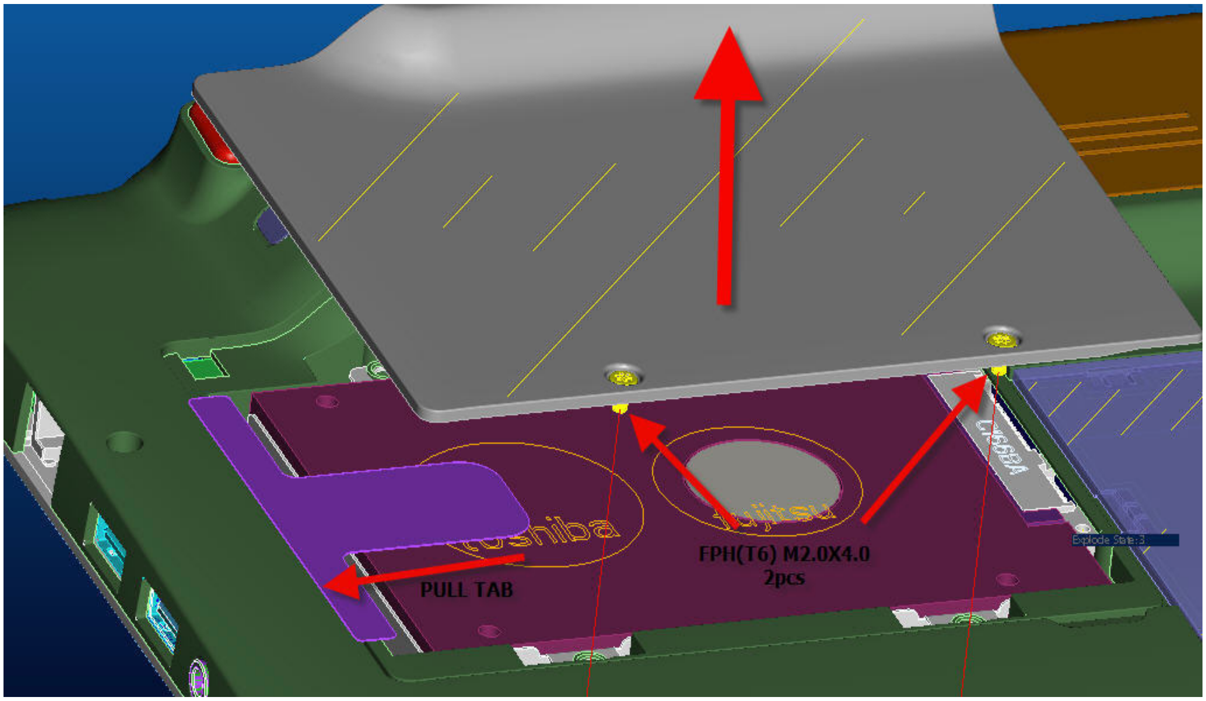


Figure 4-3-2 Remove HDD assembly

5. Remove the following **screws** securing the HDD holder and remove the **HDD holder**.

   - M3.0×3.0B FLAT BIND screw x4

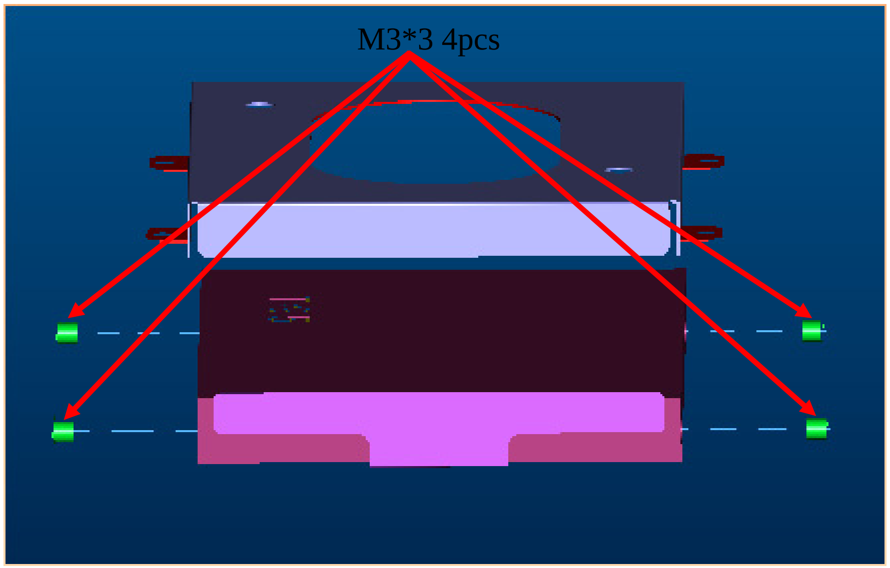


Figure 4-3-3 Remove HDD

Installing HDD-H9.5mm

The following describes the procedure for installing the main HDD.

1. Install a HDD to the **HDD holder** and secure it with the following **screws**.

   - M3.0×3.0F FLAT BIND screw x4

NOTE:	*Although they are 3mm head screws, screw torque must be set in 2.5kg-cm for four screws securing the HDD holder.*

2. Insert the **HDD assembly** into the HDD slot and connect it carefully to the **MAIN HDD** on the system board.

3. Use a T6-bit TORX to secure the **HDD assembly** with the following **screw**.

   - M2.0×4.0B T6 screw x2

4.4 Memory Module

> ***CAUTION:*** *The power of the computer must be turned off when you remove a memory module. Remove a memory module with the power on risks damaging the module or the computer itself.*
>
> *Do not touch memory module terminals. Any dirt on the terminals may cause memory access problems.*
>
> *Never press hard or bend a memory module.*

Removing a memory module

To remove a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-4-1 to 4-4-2).

1. Loose the **screw** securing the **memory slot cover**.
2. Remove the **memory slot cover**.
3. Open the left and right **latches** and remove a **memory module**.

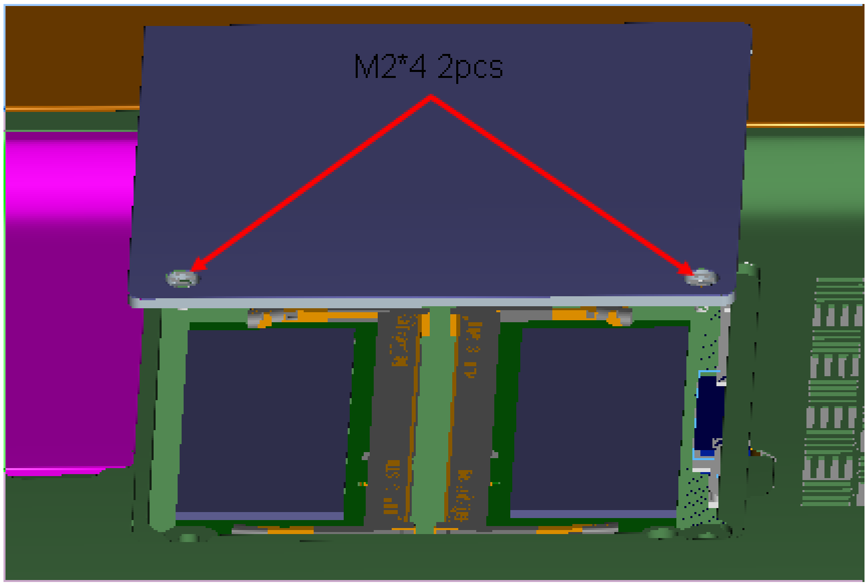


Figure 4-4-1 Remove memory slot cover

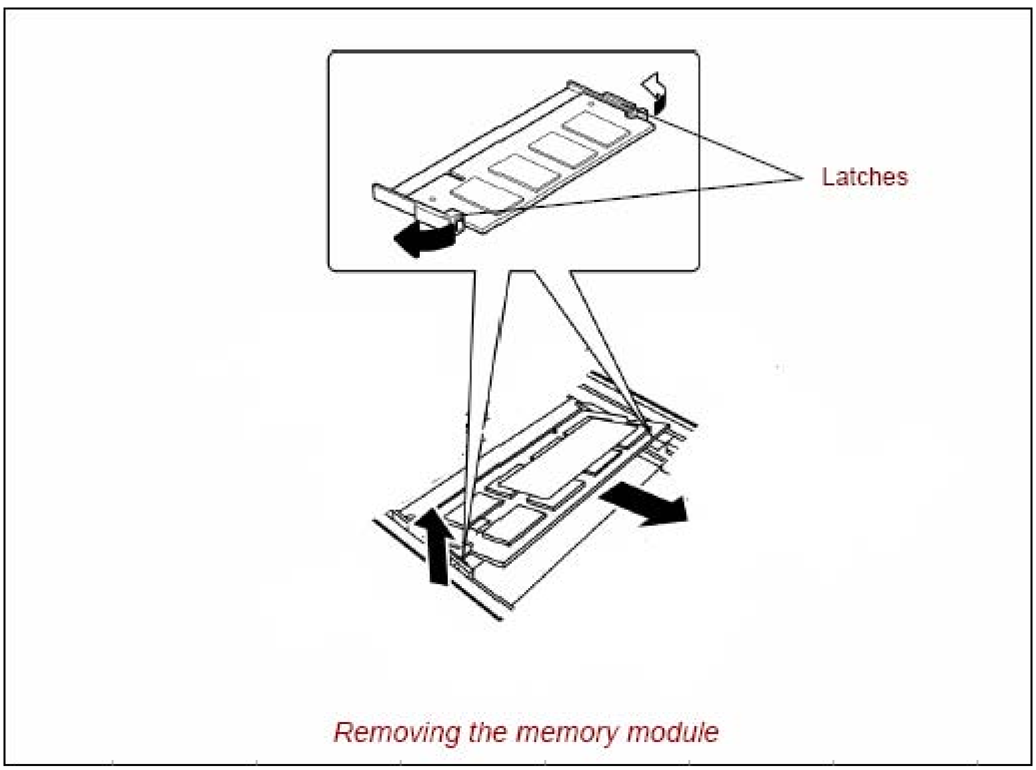


Figure 4-4-2 Remove a memory module

Installing a memory module

To install a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-4-3).

1. Insert a **memory module** into the connector of the computer slantwise (terminal side first) and press it to connect firmly.

> ***CAUTION:*** *The power must be turned off when you insert a memory module. Inserting a memory module with the power on might damage the module or the computer itself.*
>
> *Never press hard or bend a memory module.*

2. Install the **memory slot cover** and secure it with the **screw**.

3. When the power of the computer is turned on, the computer checks automatically the memory size. Confirm that the new memory is detected correctly.

4. If the memory is not detected, check that it is connected correctly.

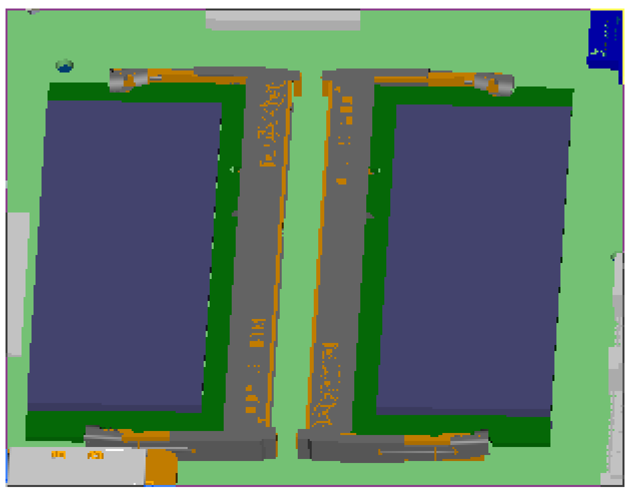


Figure 4-4-3 Insert a memory module

4.5 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard (See Figure 4-5-1 to 4-5-2).

> ***CAUTION:*** *As the keycap may fall out, when handling the keyboard always hold it by the frame and do not touch the keycap.*

1. Upside down the computer and remove the battery.
2. Loose the screws on KB holder.

   M2.0x2.0B Flat BIND screws x2

3. Open the display.
4. Insert your finger into the slot between the KB holder and the keyboard. Then, lift up the **keyboard holder** to remove it.
5. Loose the **screw** securing Keyboard.

   M2.0x3.0B Flat BIND screws x2

6. Insert your finger into the slot between keyboard and Top cover Assembly. Then lift up the **keyboard** to remove it.
7. Disconnect keyboard cable.

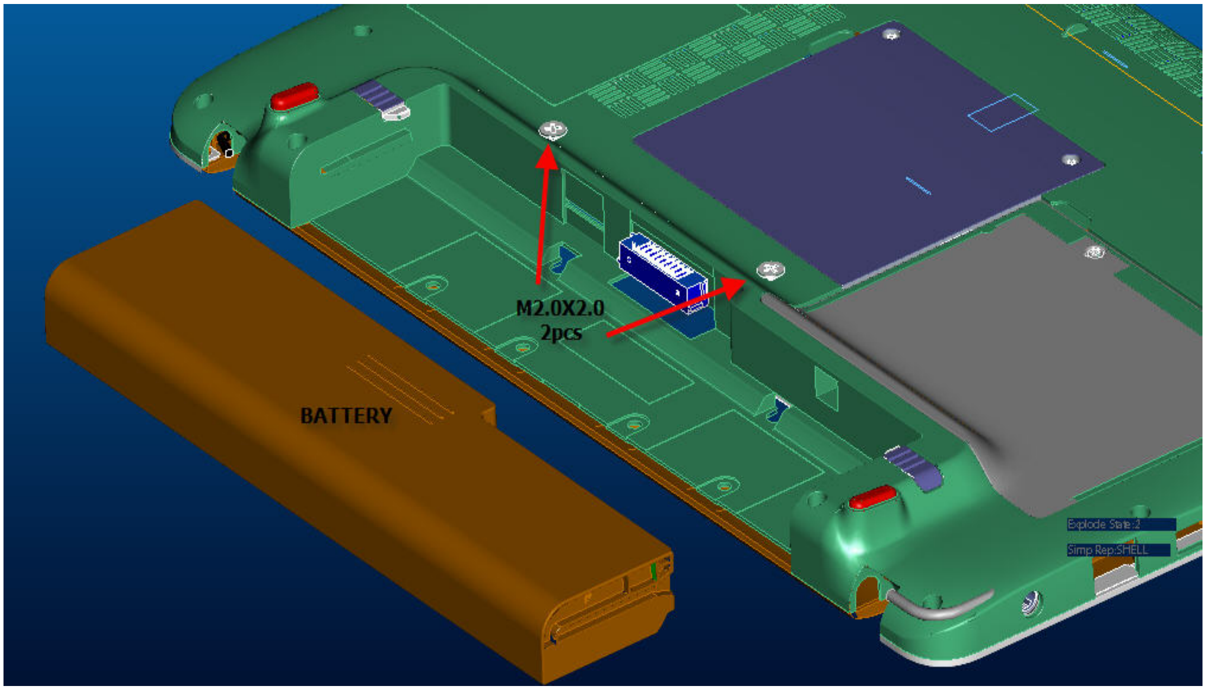


Figure 4-5-1 Remove 2 screws for KB Holder

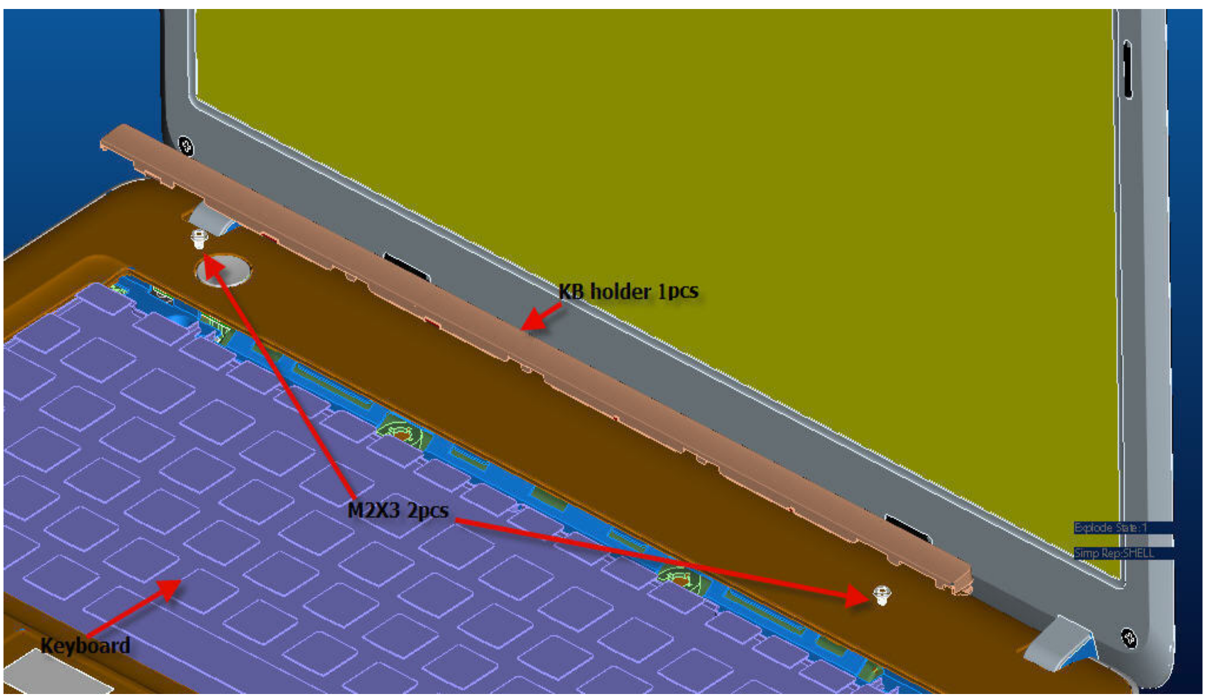


Figure 4-5-2 Remove 2 screws for Keyboard

Installing the keyboard

The following describes the procedure for installing the keyboard.

1. Connect the **keyboard flexible cable** to the connector on the system board.
2. Slide and set the **keyboard** then secure it with the following **screw**.
   - M2.0×3.0B FLAT BIND screw x2
3. Install the **K/B holder** by pressing it from the topside.
4. Upside down the computer and secure the **KB holder** with the following screw.
   - M2.0×2.0B FLAT BIND screw x2

4.6 Wireless LAN card and BT Module

Removing a Wireless LAN card

The following describes the procedure for removing a Wireless LAN card (See Figure 4-6-1 to 4-6-2).

1. Remove the screw of **wireless LAN card.**

   - M2x 2.5 BIND screw x2

2. Disconnect the **wireless LAN antenna cable** from the connectors on a wireless LAN card.

3. Remove a **wireless LAN card** from the **connector** on the system board.

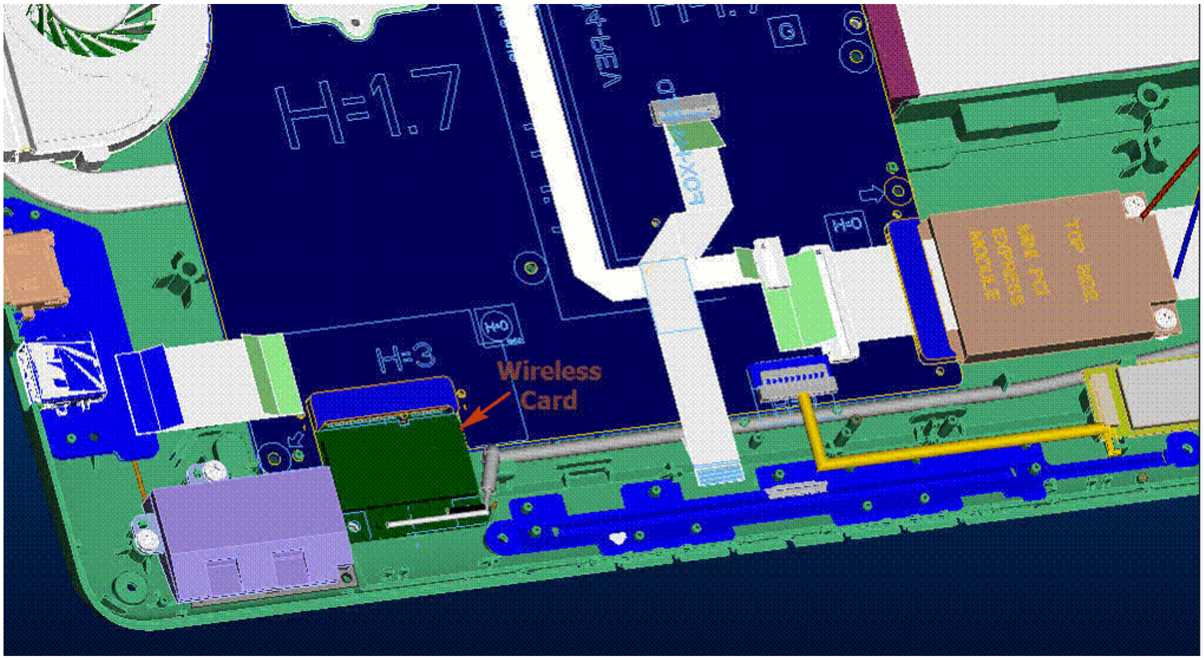


Figure 4-6-1 Wireless LAN card

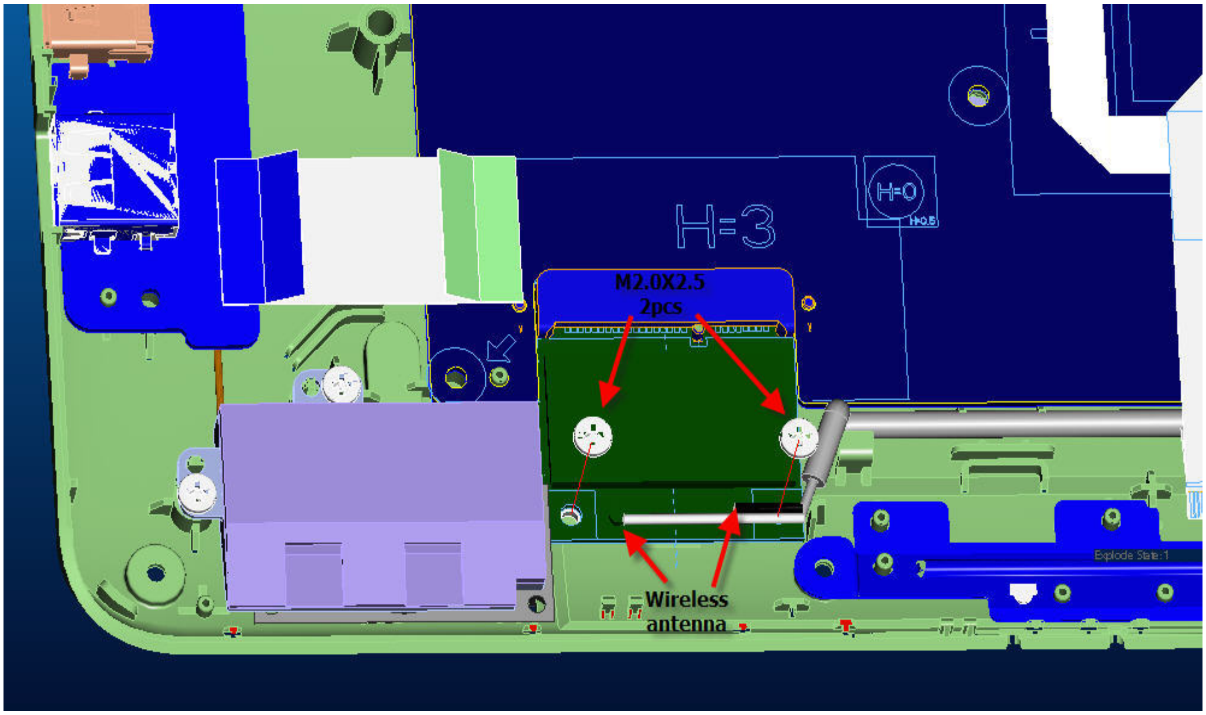


Figure 4-6-2 Remove a wireless LAN card

Installing a Wireless LAN card

The following describes the procedure for installing a Wireless LAN card.

1. Insert a **wireless LAN card** terminals slantwise into the connector on the computer and press a wireless LAN card and lock the secure screws.

2. Connect the **wireless LAN antenna cable** to the terminals on a wireless LAN card.

3. Put the **wireless LAN antenna cable** on the right location from the guide.

   Then install **BT module** on the base and connect **BT cable** on system board.

   (See Figure 4-6-3)

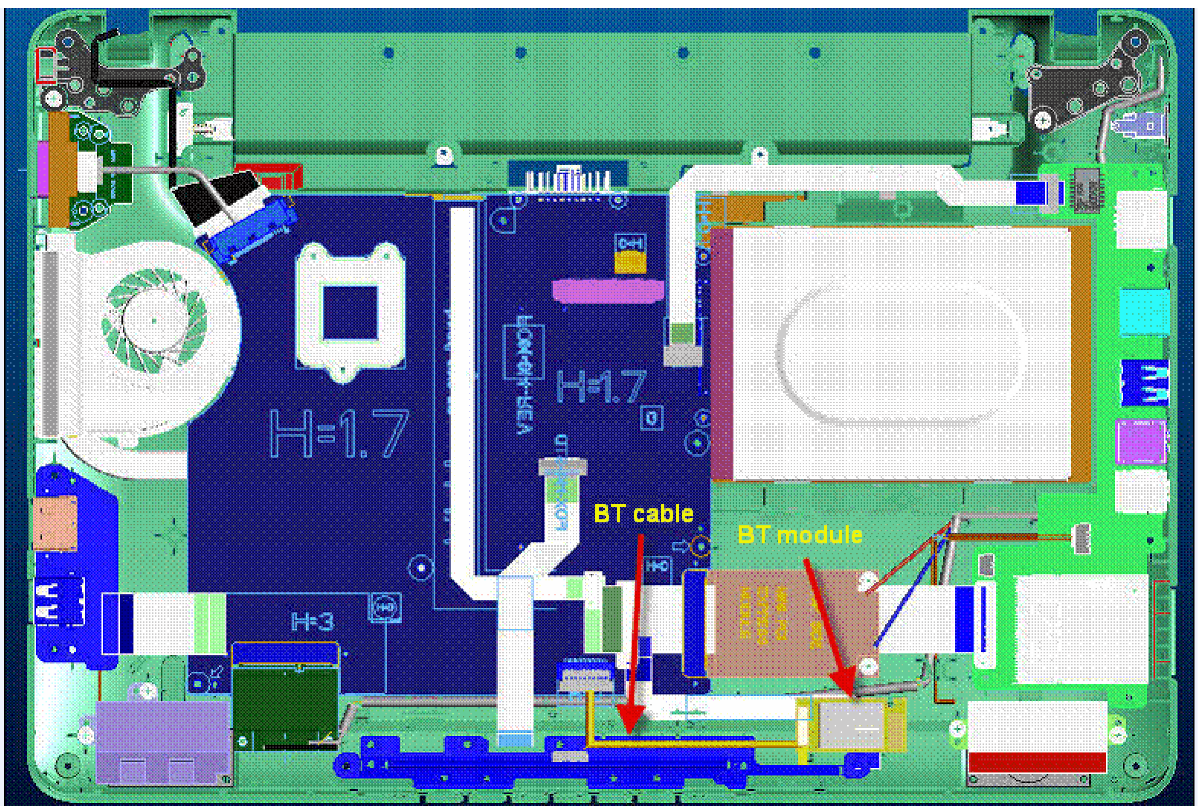


Figure 4-6-3 Cables layout on motherboard

4.7 3G module card

Removing 3G module card

The following describes the procedure for removing a 3G module card (See Figure 4-7-1 to 4-7-3).

1. Remove screw of 3G module board.

   - M2x 3.0 BIND screw x2

2. Disconnect the **3G module antenna cable** from the connectors on a 3G module card

3. Remove a **3G module card** from the **connector** on the system board.

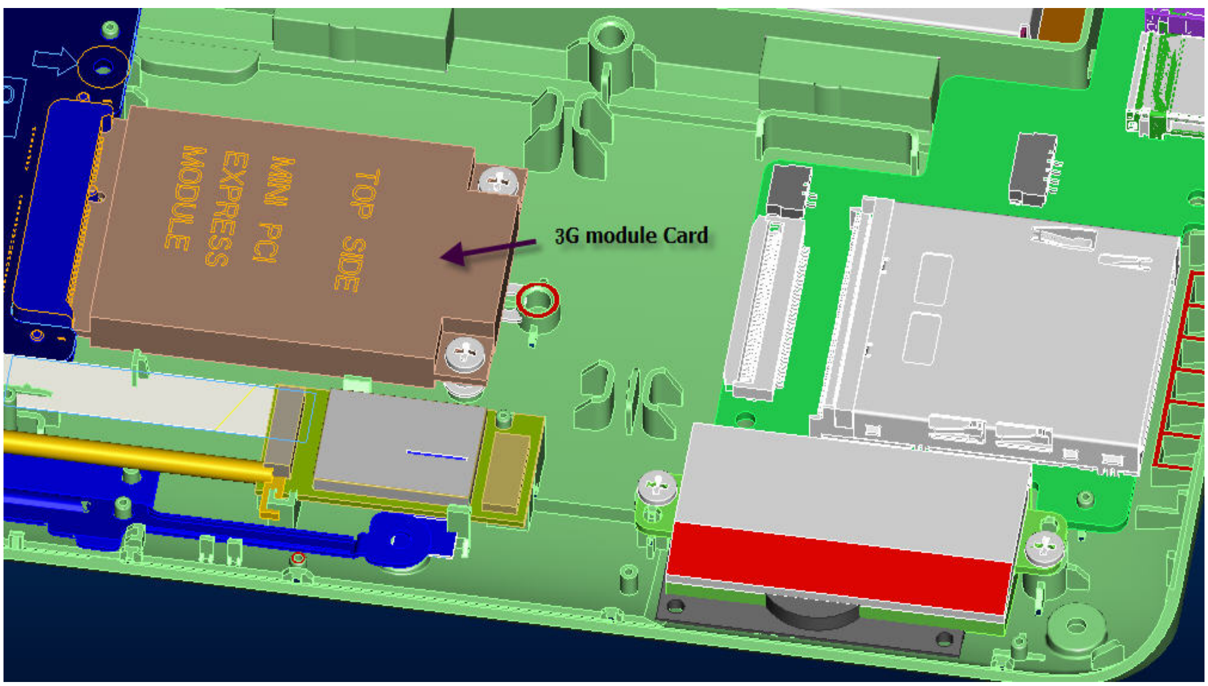


Figure 4-7-1 3G module card

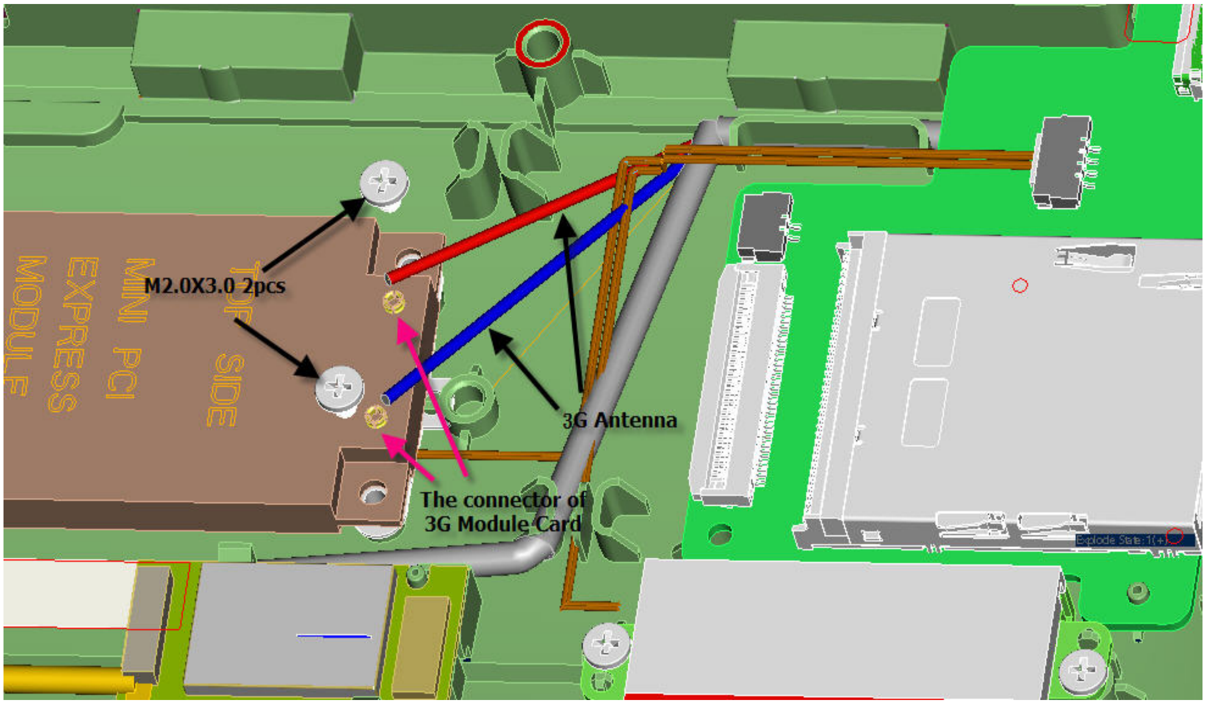


Figure 4-7-2 Remove a 3G module card

Installing a 3G module card

The following describes the procedure for installing a 3G module card. (See Figure 4-7-3)

1. Insert a **3G module card** terminals slantwise into the connector on the system board and press a **3G module card** and lock the secure screws.
2. Connect the **3G module antenna cable** to the terminals on a 3G module card.
3. Put the **3G module antenna cable** on the bottom location from the guide.

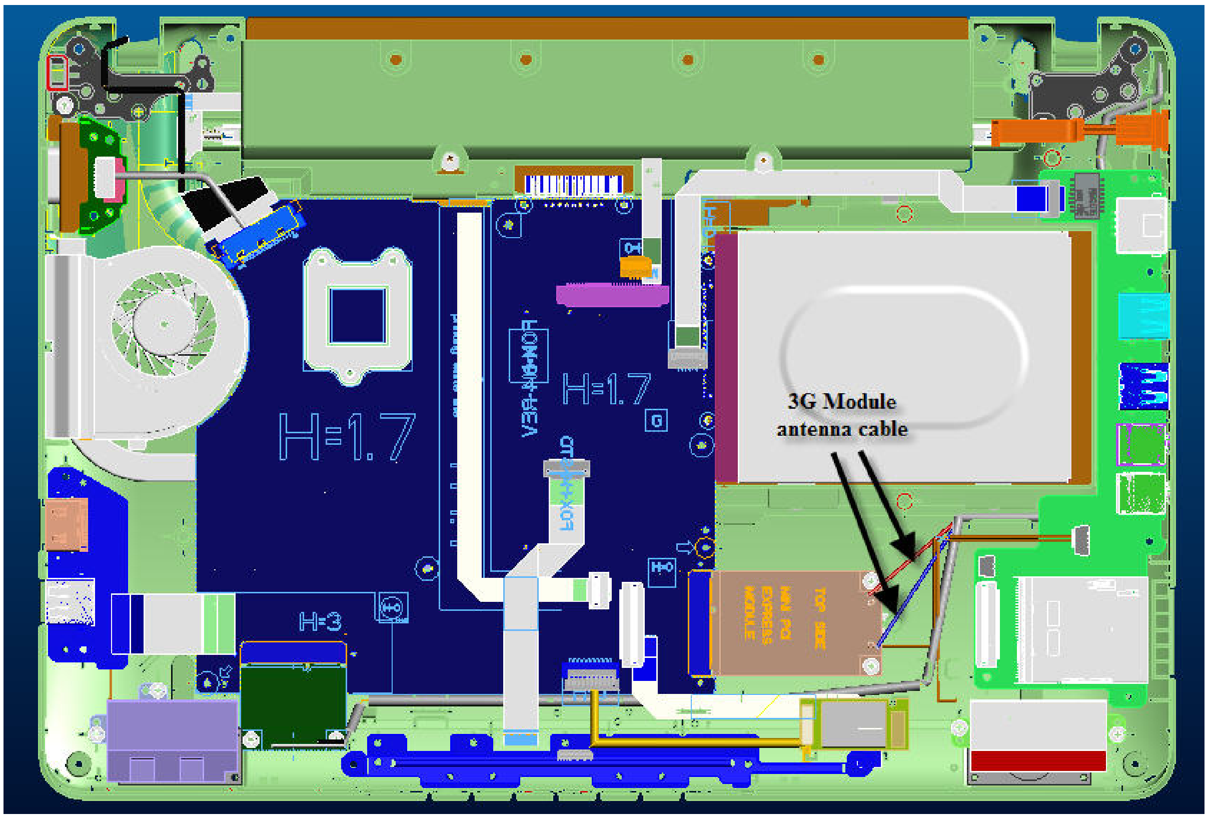


Figure 4-7-3 Cables layout on motherboard

4.8 Display Assembly

Removing the display assembly

The following describes the procedure for removing the display assembly (See Figure 4-8-1 to 4-8-5).

1. Close the display and turn the computer upside down.
2. Remove the battery pack (See Figure 4-2-1)
3. Open HDD Door

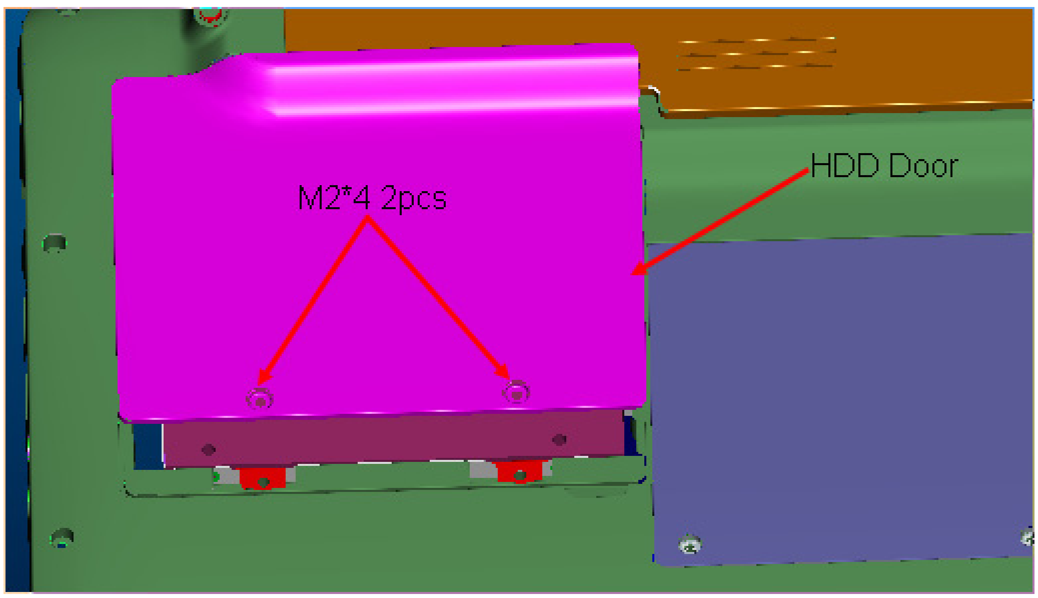


Figure 4-8-1 Remove the screws (securing display assembly)

4. Remove the screws from the bottom side.

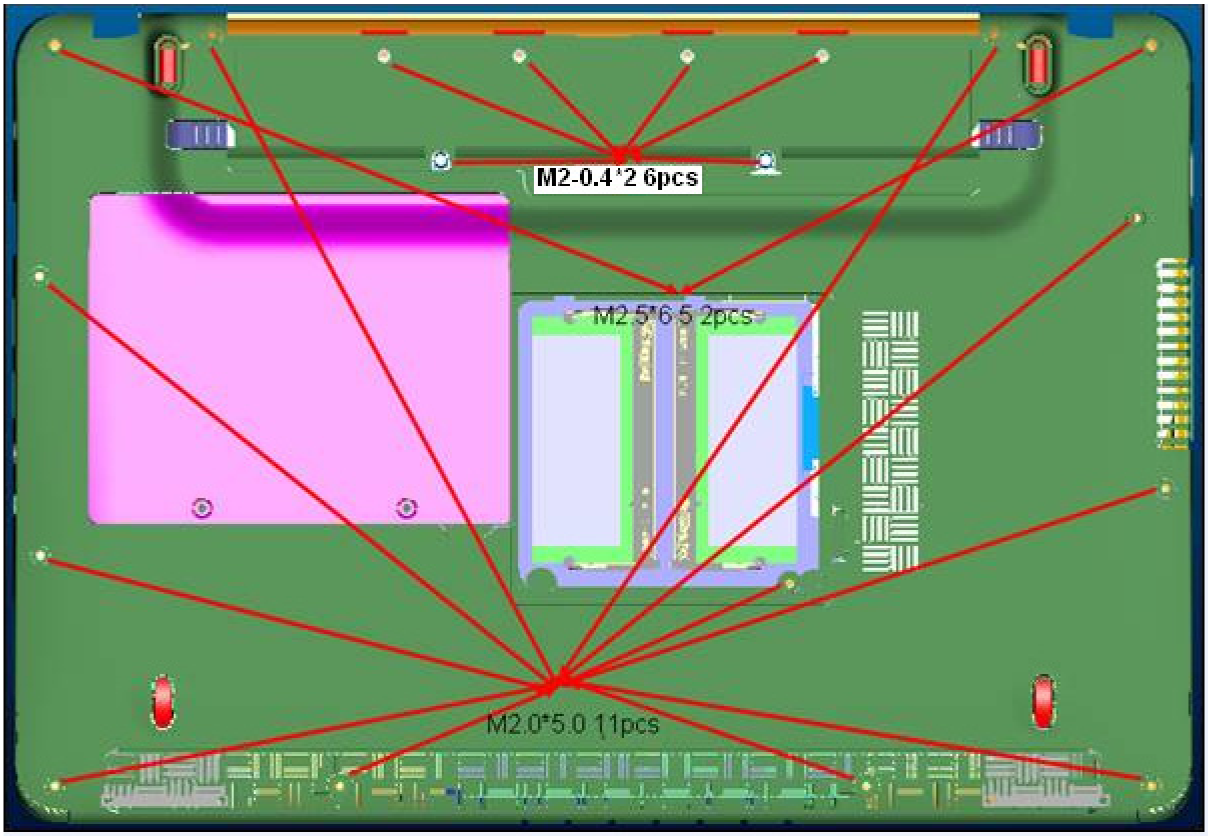


Figure 4-8-2 Remove the screws (from bottom side)

5. Disassemble **KB Holder** and **KB** screw (See Figure 4-5-1)
6. Remove the screws from the top side and remove the cover.

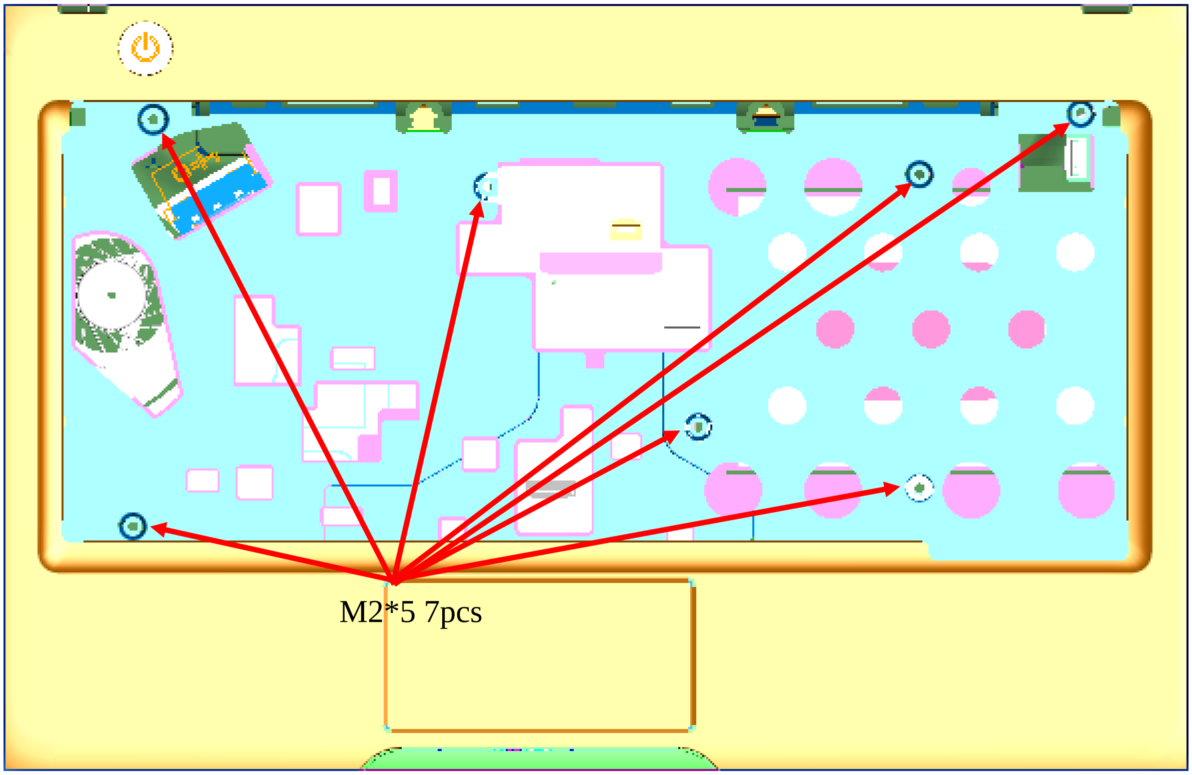


Figure 4-8-3 Remove the screws (from top side)

7. Disconnect the FFC and cables.
8. Disassembly TOP ASSY
9. Pull out the **wireless LAN antenna** from the guide with two hands.

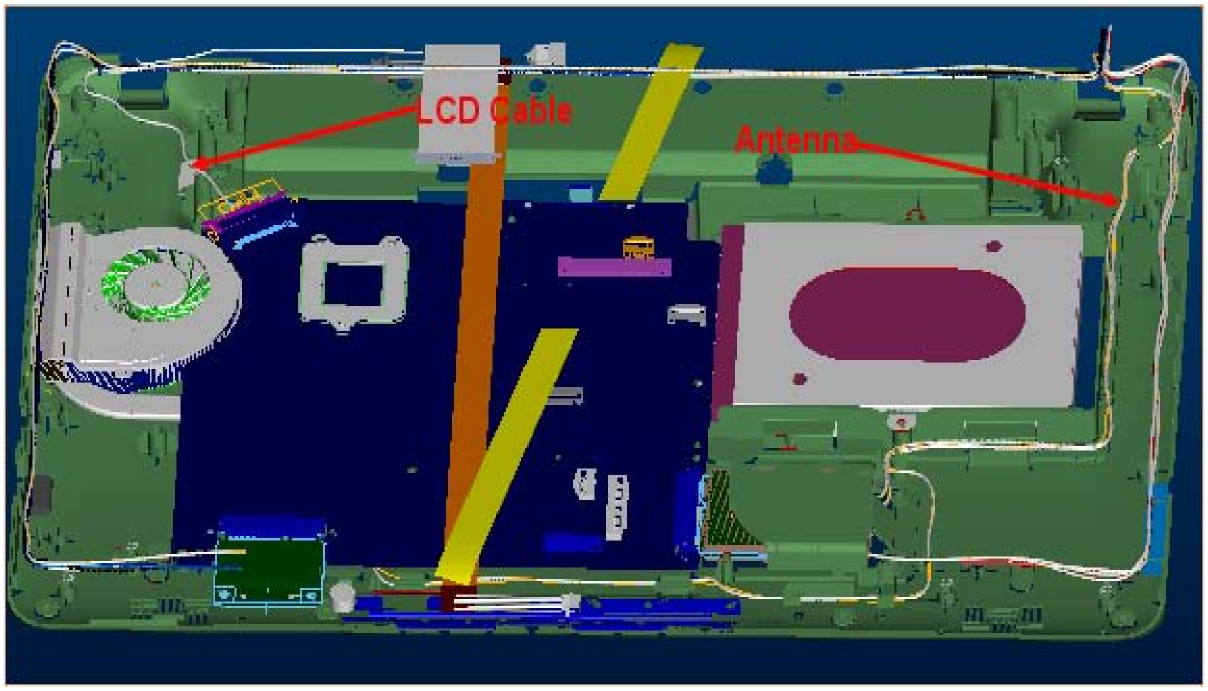


Figure 4-8-4   Remove the Wireless Antenna and LCD cable

10. Pull out the **LCD cables** from the guide of system board.

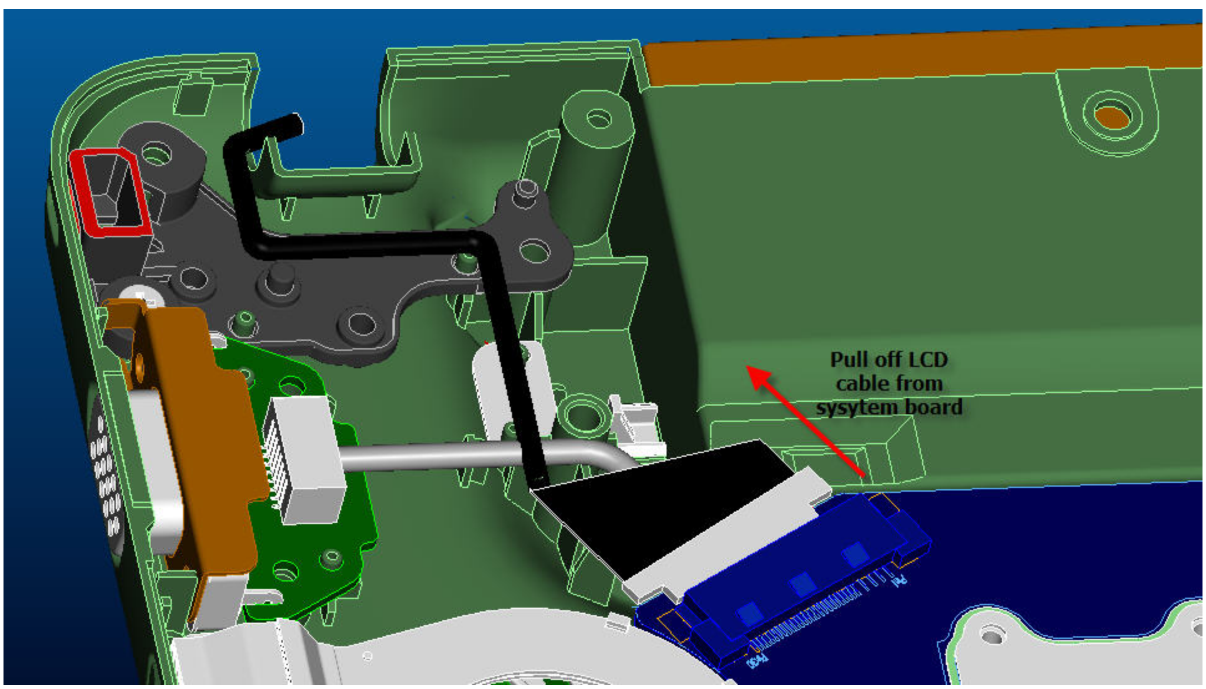


Figure 4-8-5   Remove the LCD cable from system board

11. Pull out the **LCD cables** from the guide of LCD panel.

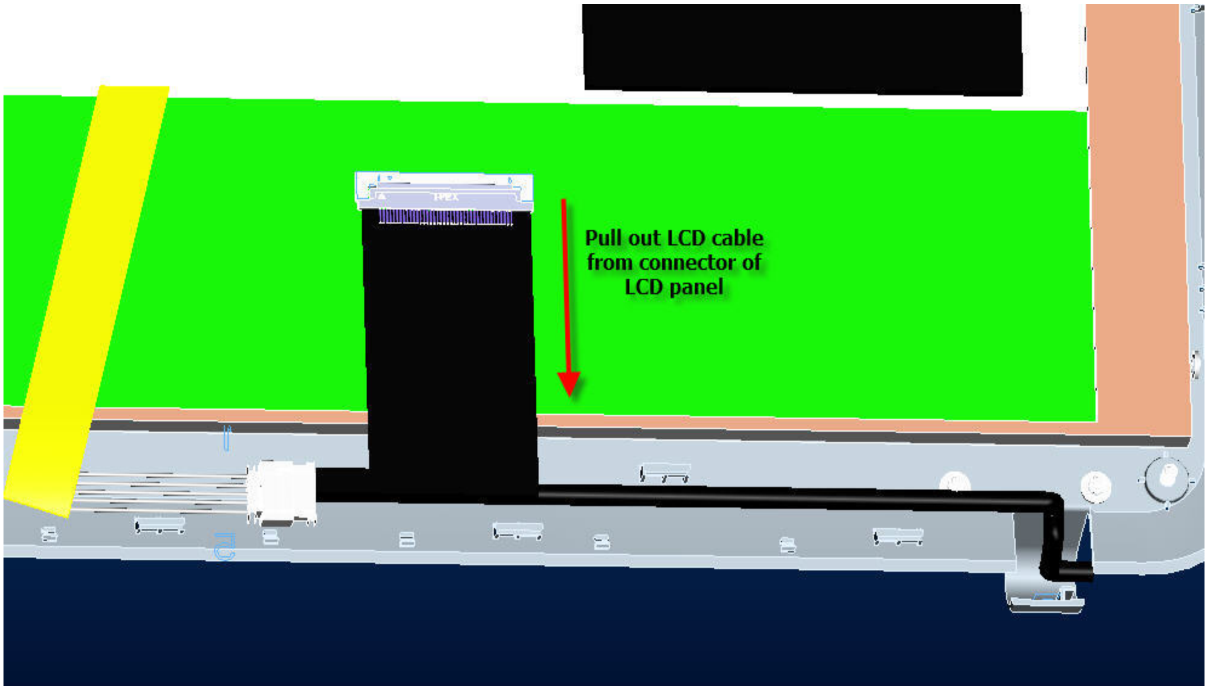


Figure 4-8-6   Remove the LCD cable from LCD panel

Opening the display to 135degree, keeping display side by hand and remove the hinge screw.

- M2.5×3 FLAT BIND screw x4(Lock tight)
- M2.5×6.5 FLAT BIND screw x2(Lock tight)

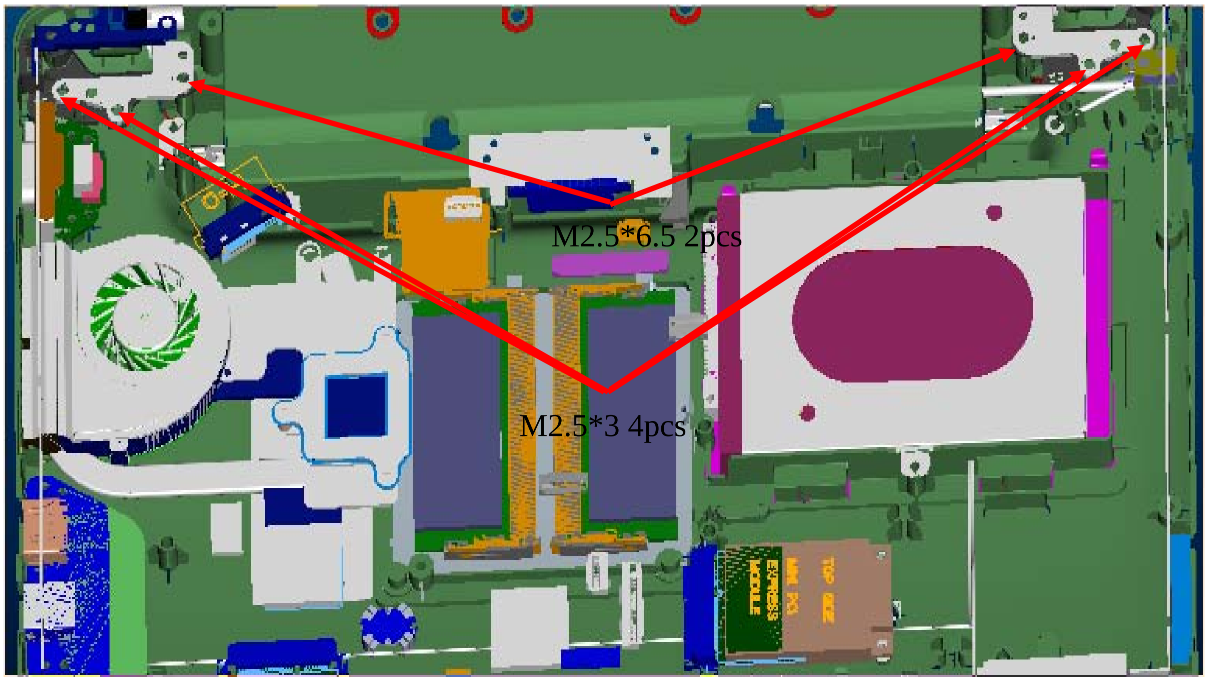


Figure 4-8-7 Remove the hinge screws

12. Remove the **display assembly** with two hands holding from the base assembly.

Installing the display assembly

The following describes the procedure for installing the display assembly.

1. Inserting the **pole of hinge** to the **hole** of hinge assembly, set the **display assembly** with hands on the base assembly.

2. Secure the **hinges** with the following **screws** secure the **display mask** with the following **screws** and stick the **mask seal** on them.

- M2.5×3 FLAT BIND screw x4(Lock tight)
- M2.5×6.5 FLAT BIND screw x2(Lock tight)

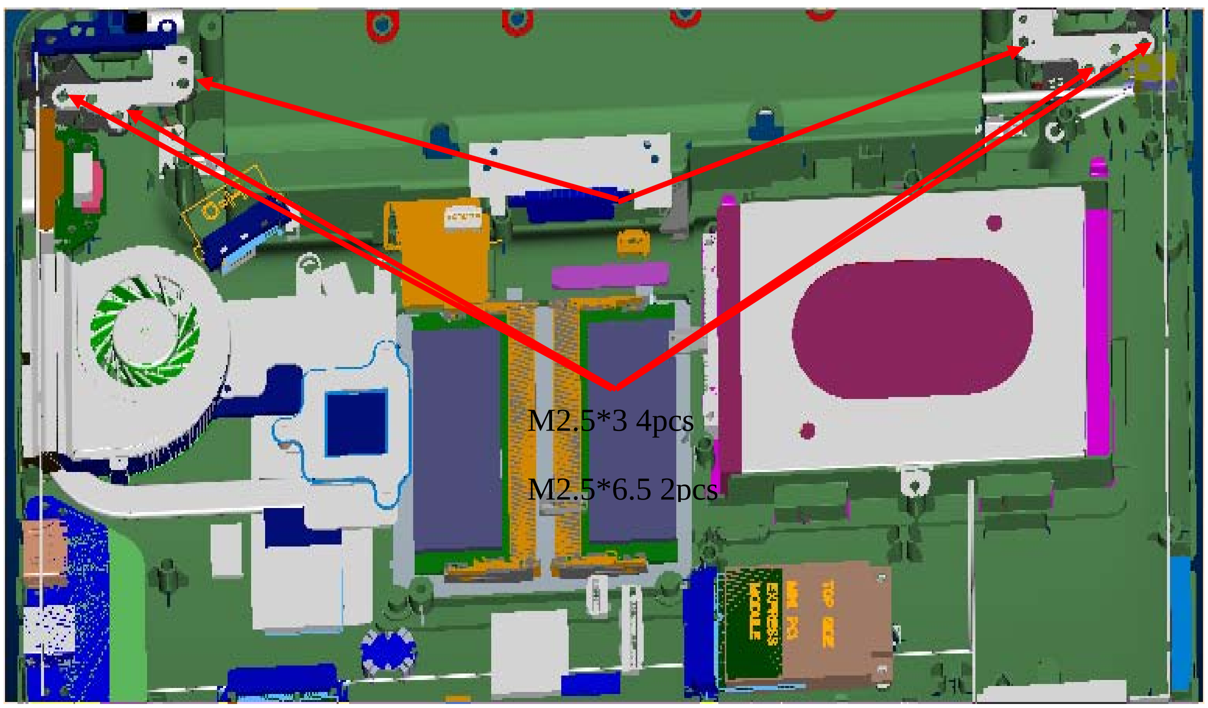


Figure 4-8-8 Securing the hinge screws

***NOTE**: Be sure to apply the locktight to the screws instructed in the figure above.*

3. Connect the **LCD harness** to the connector on the system board.

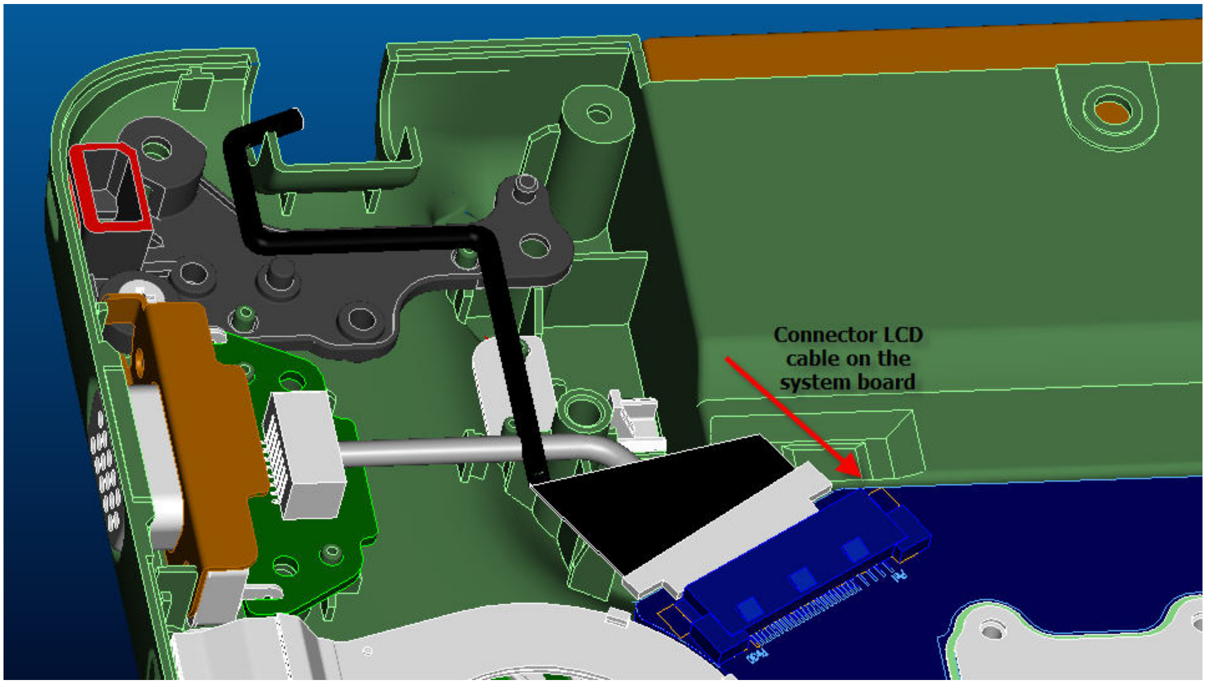


Figure 4-8-9 Connecting LCD harness to the system board

4. Arrange the wireless antenna cables along the guide (front) and secure them with **guide**.

5. Pass the cables to the back of computer through the **slot**.

6. Arrange the **Wireless LAN antenna** along the guide and contact with the connector with hands.

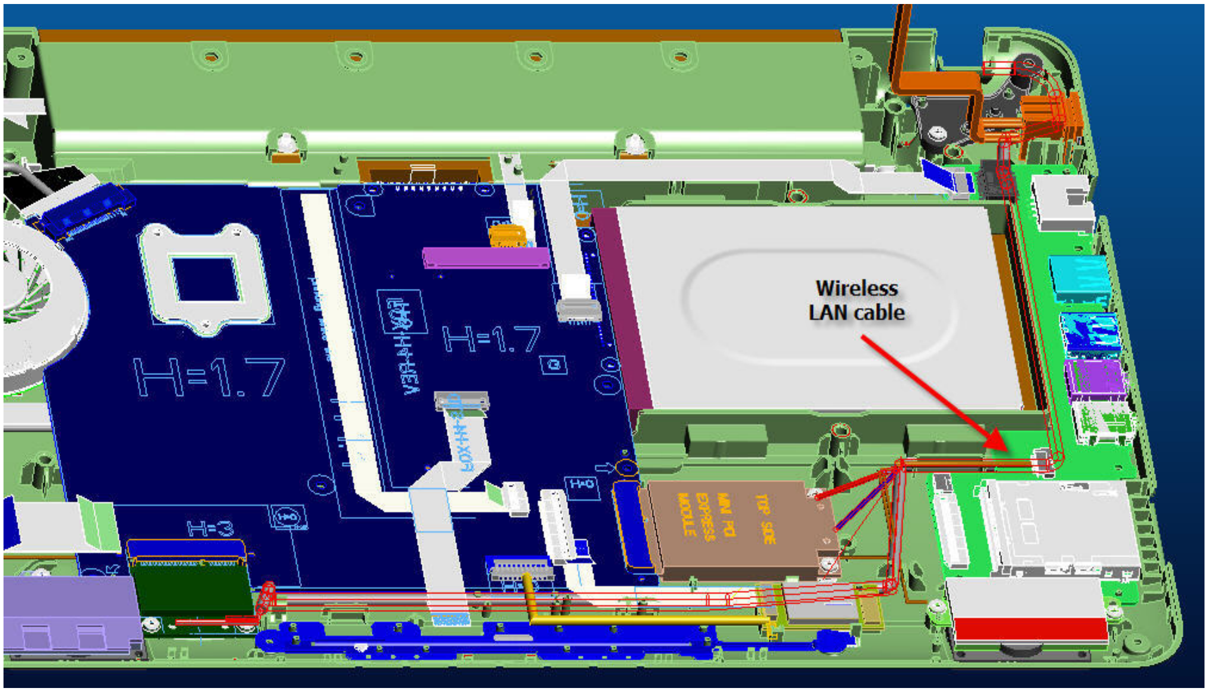


Figure 4-8-10 Arrange and connect Wireless LAN cable

7. Install the LAN board and Top cover Assembly of the system.

> ***NOTE**: If Fingerprint or Dust left on LCD screen during disassembly and assembly LCD units, please follow Appendix A to clean it.*

4.9 Top Cover Assembly

Removing the Top cover assembly

The following describes the procedure for removing the Top cover assembly (See Figure 4-9-1 to 4-9-3).

1. Turn over the computer.

2. Remove the following **screws** securing the Top cover assembly from the back and bottom of computer.

- M2-0.4×2 FLAT BIND screw Back x6
- M2.5×6.5 FLAT BIND screw Back x2
- M2.0×5.0 FLAT BIND screw Back x11

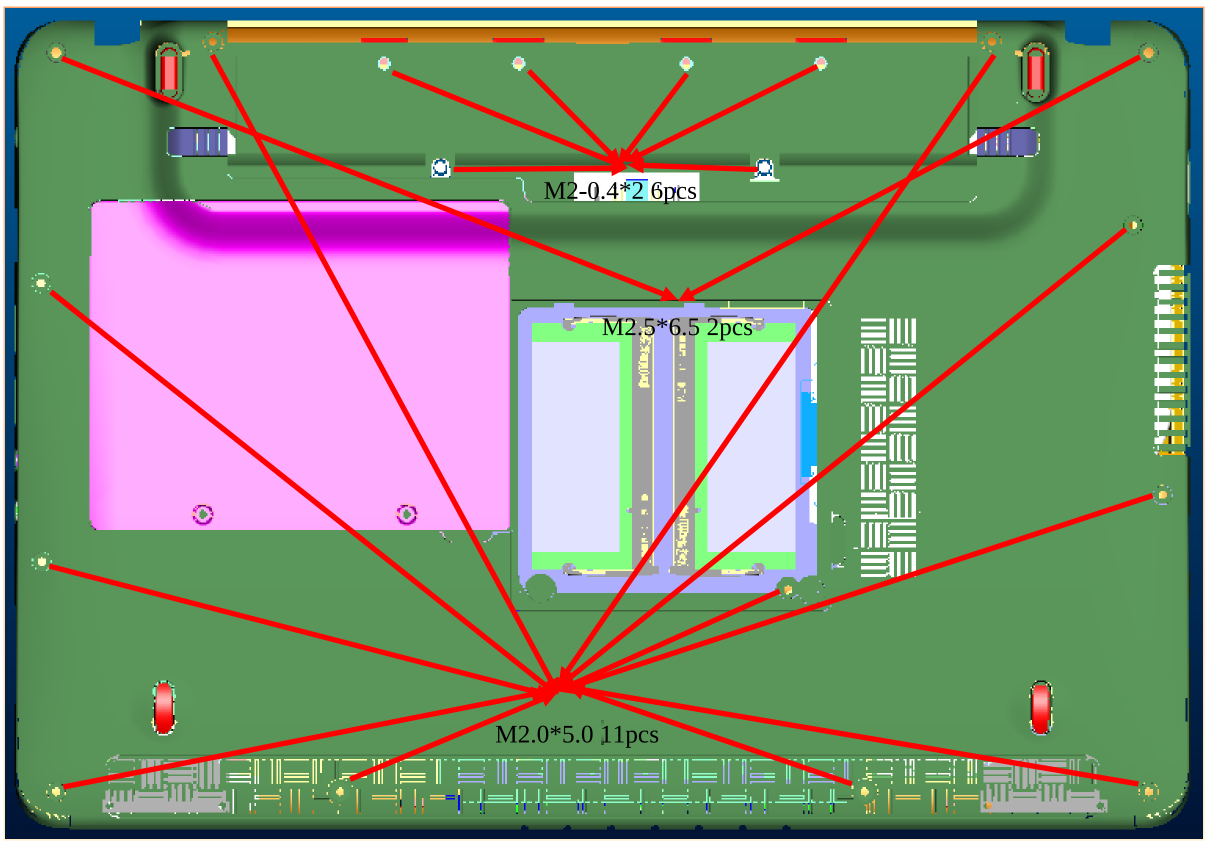


Figure 4-9-1 Remove the screws (back)

3. Remove the following **screws** securing the Top cover assembly from the front of computer. Pull up and remove the **Top cover assembly** from the **Base assembly**.

M2.0×5.0 FLAT BIND screw Back x11

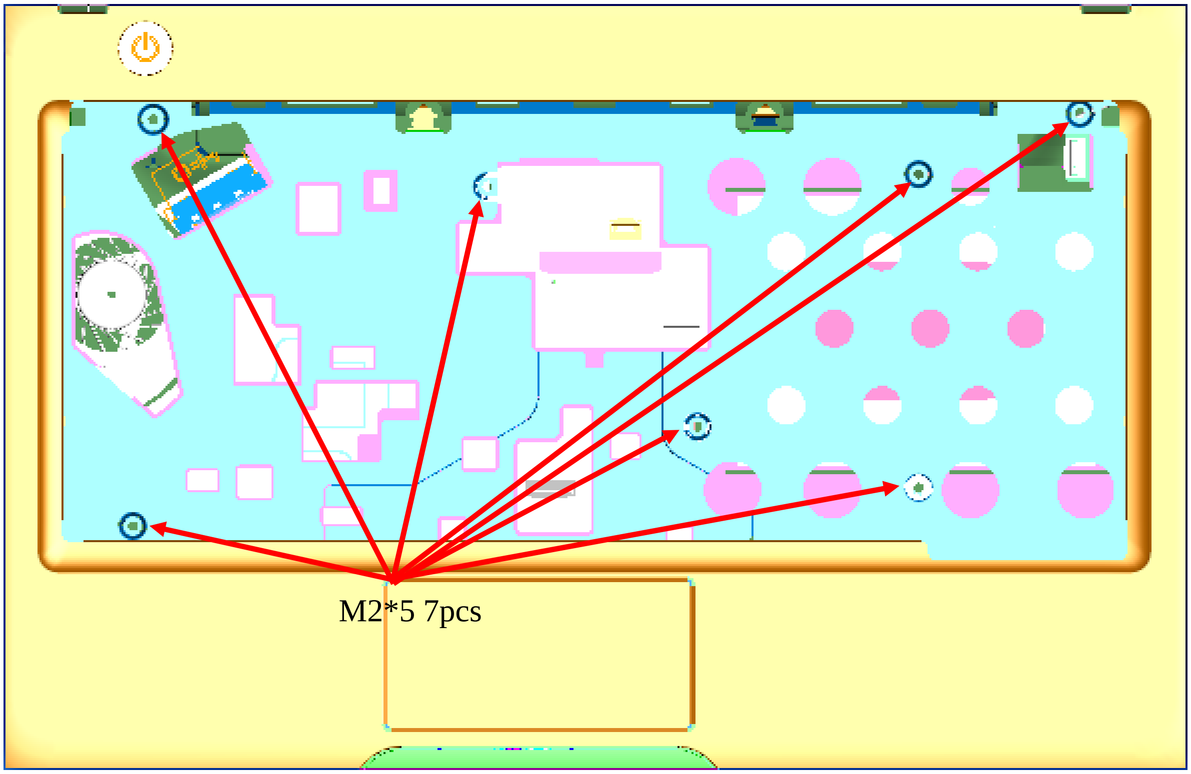


Figure 4-9-2 Remove the screws (front) and Top cover assembly

4. Disconnect the **touch pad flat cable/LAN cable/Power cable** from the connector on the system board.

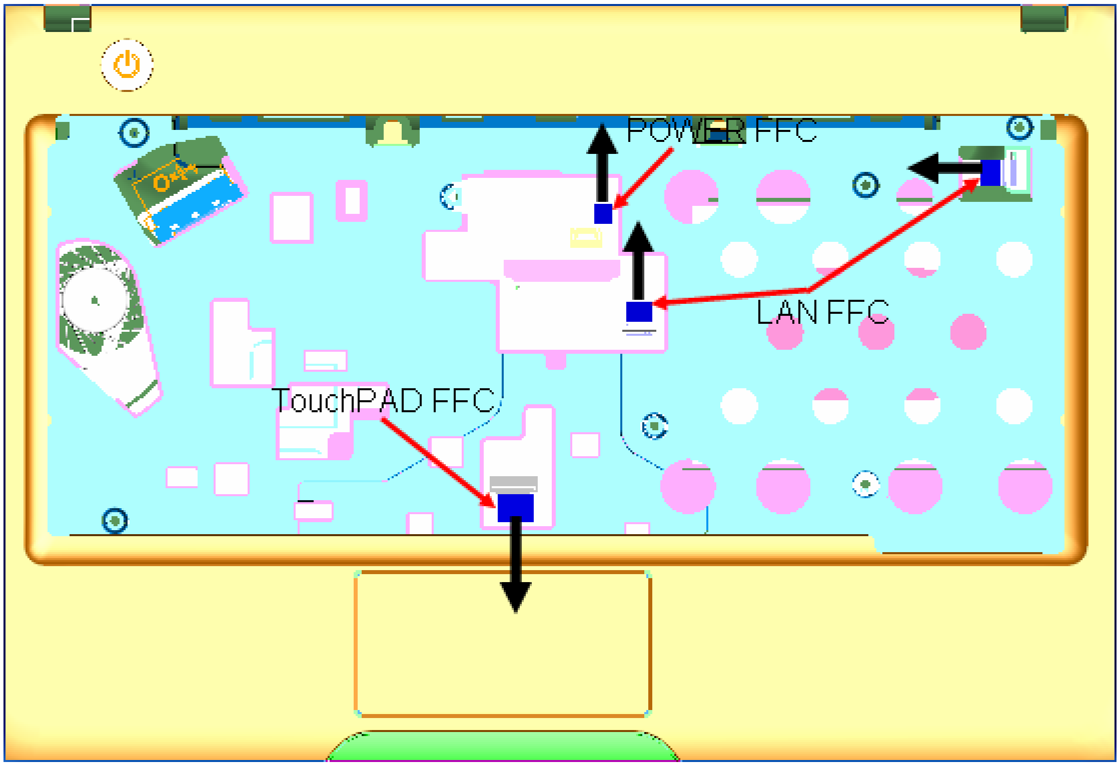


Figure 4-9-3 Disconnect the touch pad flat cable/LAN cable

Installing the Top cover assembly

The following describes the procedure for installing the Top cover assembly.

1. Install the **Top cover assembly** to the Base assembly.

NOTE: *Be careful not to catch the cables between Top cover assembly and Base assembly.*

2. Connect the **touch pad flat cable** to the connector on the system board.
3. Secure the Top cover assembly with the following **screws** from the back and bottom of computer.

   - M2-0.4×2 FLAT BIND screw Back x6
   - M2.5×6.5 FLAT BIND screw Back x2
   - M2.0×5.0 FLAT BIND screw Back x11

4. Free the cable from cable-drain when through the antenna cable to PCB hole.

4.10 Touch Pad

Removing the touch pad

The following describes the procedure for removing the touch pad (See Figure 4-10-1 to 4-10-3).

1. Peel off the **glass tape** and disconnect the **touch pad flat cable, Fingerprint cable** from the connector on the touch pad.
2. Remove the following **screws** securing the Touch pad plate.
   - M2x2-I SUPER THIN HEAD screw x6
   - M2-0.4x2 SUPER THIN HEAD screw x2
   - M2.0x3.0 SUPER THIN HEAD screw x2
3. Remove the **touch pad board and touch pad plate**.
4. Peel off and remove the **touch pad** from the Top cover assembly.

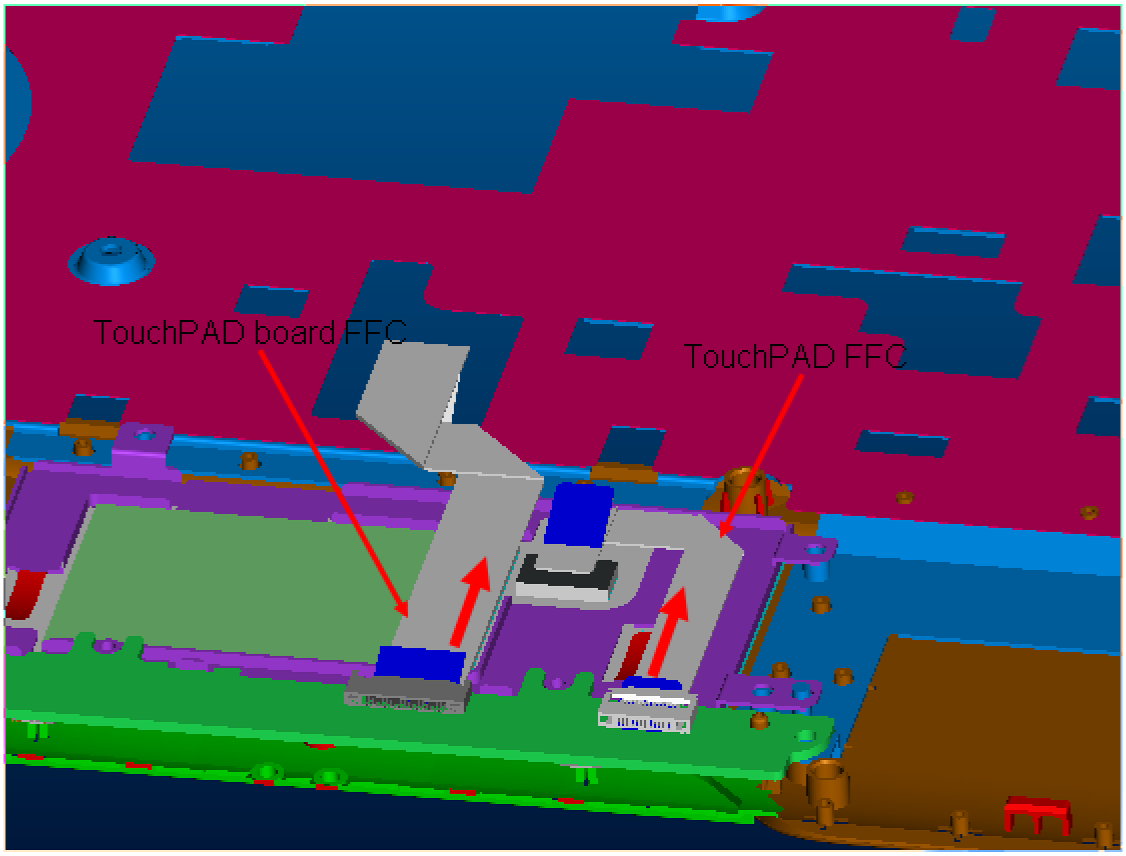


Figure 4-10-1 Remove the touch FFC cable

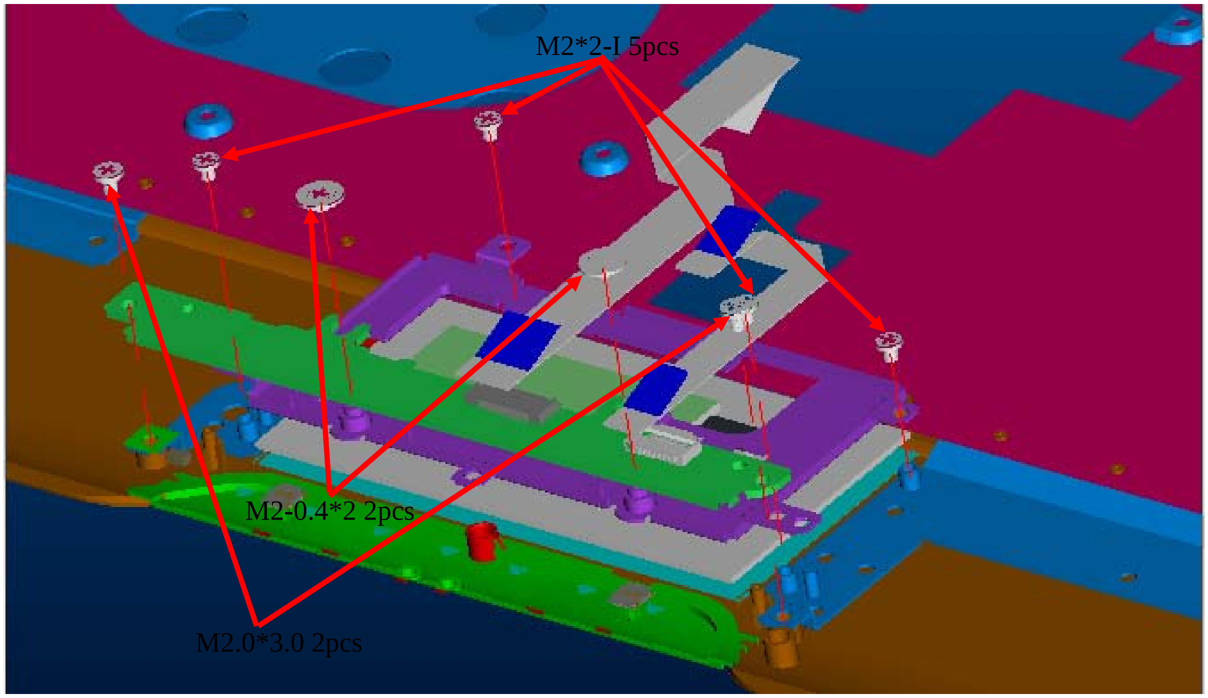


Figure 4-10-2 Loose the screws

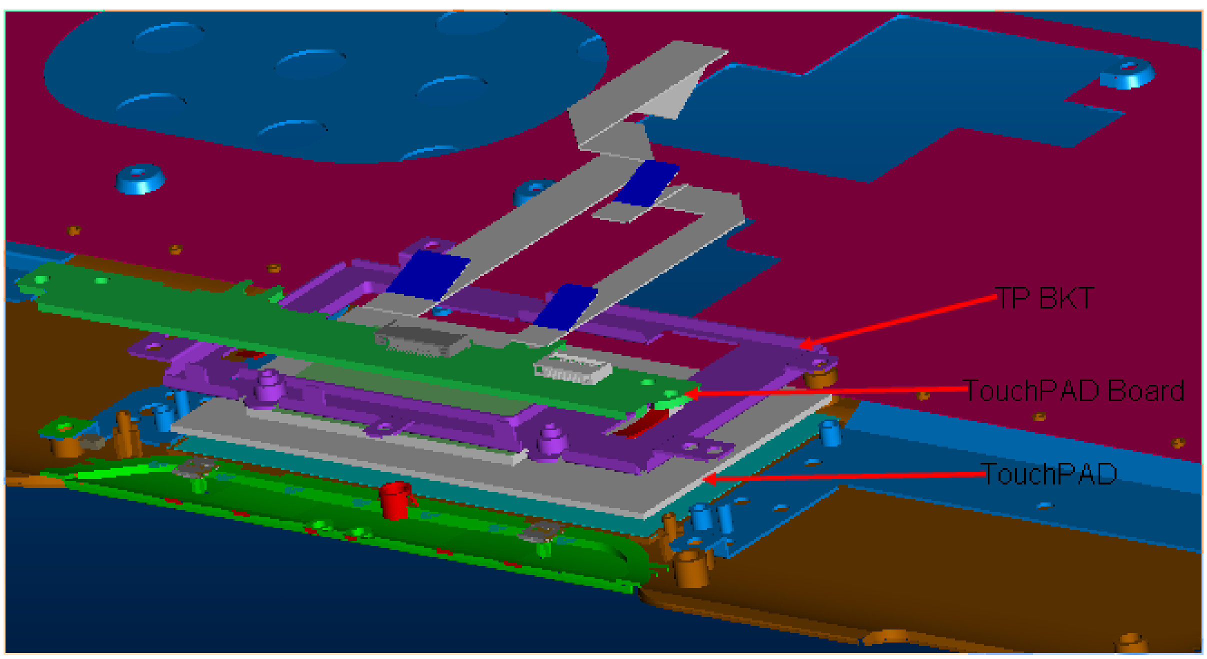


Figure 4-10-3 Remove the touchpad and touchpad board

Installing the touch pad

The following describes the procedure for installing the touch pad.

1. Peel off the separator covering on the sensor portion of a new touch pad.

> ***NOTE***: *Do not reuse the touch pad so that it can not be used after peeling off from the computer. Be sure to stick a new touch pad.*
>
> *When sticking the touch pad, be careful not to get the bubbles under the touch pad.*

2. Stick and install the **touch pad** on the Top cover assembly.
3. Install the **touch pad plate** and secure it with the following **screws**.
   - M2x2-I SUPER THIN HEAD screw x6
   - M2-0.4x2 SUPER THIN HEAD screw x2
   - M2.0x3.0 SUPER THIN HEAD screw x2
4. Stick the **insulator** on the touch pad plate.
5. Connect the **touch pad flat cable** to the connector on the touch pad and stick the **glass tape** on the connector.

4.11 I/O Board

The following describes for removing the I/O Board (See Figure 4-11-1).

Removing the I/O Board

1. Pull out the **I/O Board FFC, LAN FFC, Speaker cable** from I/O board connector.

2. Loose the below **screws** and then incline pull out **I/O Board.**

- M2.0x3.0 FLAT BIND screw x2

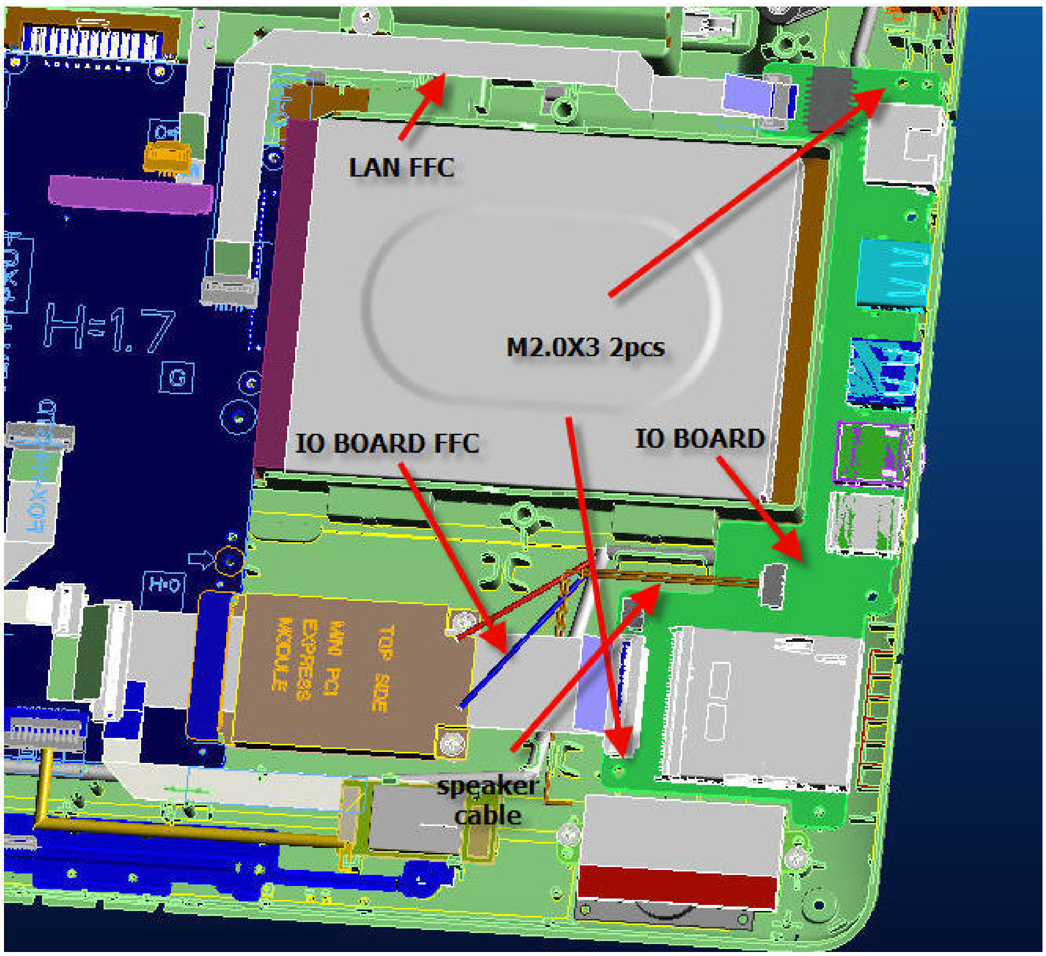


Figure 4-11-1 Remove the I/O Board

Installing the I/O Board

The following describes for installing the I/O Board

1. Fix the below **screws** then incline insert in **I/O Board**

M2.0x3.0 FLAT BIND screw x2

2. Insert the **I/O Board FFC, LAN FFC, Speaker cable** into base case and connect I/O board cable and speaker cable

***NOTE**:*	*Be careful not to catch the cables between Top cover assembly and base assembly.*

4.12 System board

CAUTION:	*1. when handling the system board, always hold by the edges. Do not touch the printed circuit face.* *2. if replacing with a new system board, execute the subtest01 Initial configuration in section 3.3 "Setting of the hardware configuration".*

Removing the system board

The following describes the procedure for removing the system board (See Figure 4-12-1).

1. Disconnect the **LAN FFC, LCD CABLE, ANTENNA, I/O board FFC, USB FFC, CRT cable, BT wire, SIM FFC, TP board FFC, Power Board FFC, DC-IN cable** from the connector on the system board.

2. Remove the following **screws** securing the system board and remove the **system board**.

   - M2.0×3.0 screw x2

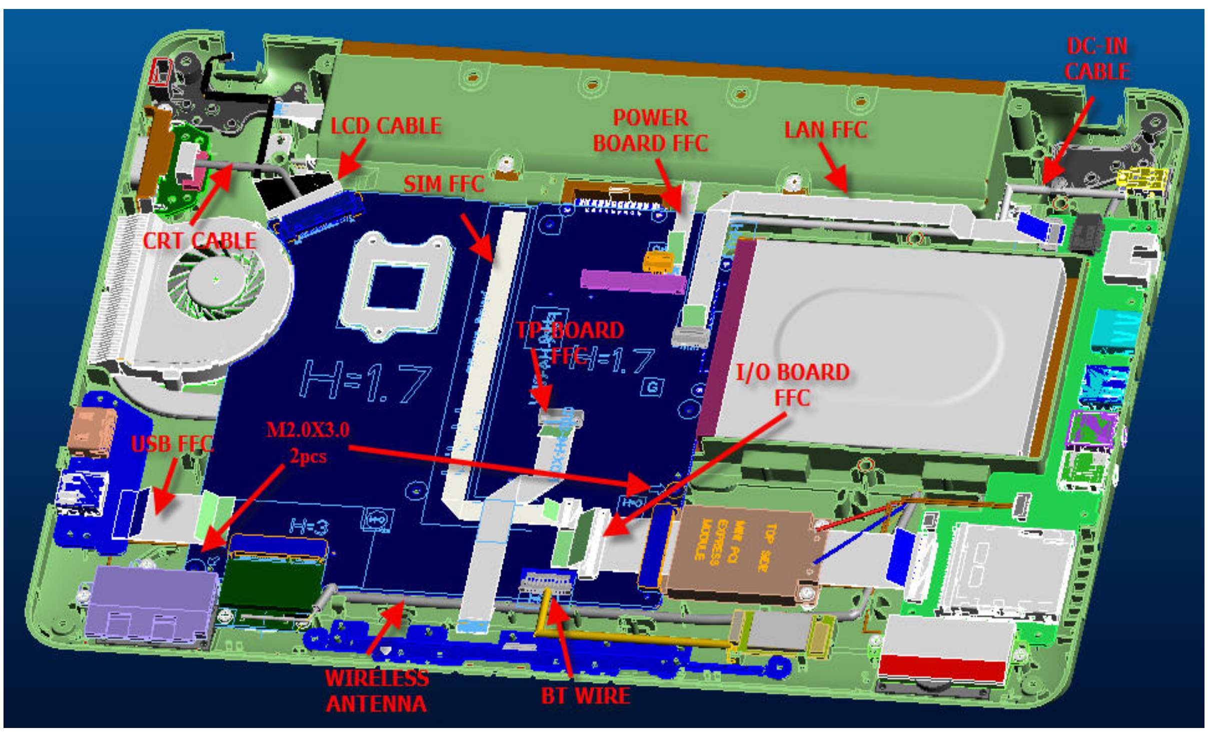


Figure 4-12-1 Remove the system board

Installing the system board

The following describes the procedure for installing the system board.

1. Secure the system board with the following **screws**.

   M2.0×3 screw x2

2. Connect the **LAN FFC, LCD CABLE, ANTENNA, I/O board FFC, USB FFC, CRT cable, BT wire, SIM FFC, TP board FFC, Power Board FFC, DC-IN cable** to the connector on the system board.

3. Connect the power cable to the connector on the system board.

Removing RTC battery

The following describes the procedure for removing the RTC battery unit (See Figure 4-12-2 to 4-12-3).

1. Pull the away the socket of RTC battery and use a clamp to hold RTC battery tightly.
2. Rotate battery through the way then remove it.

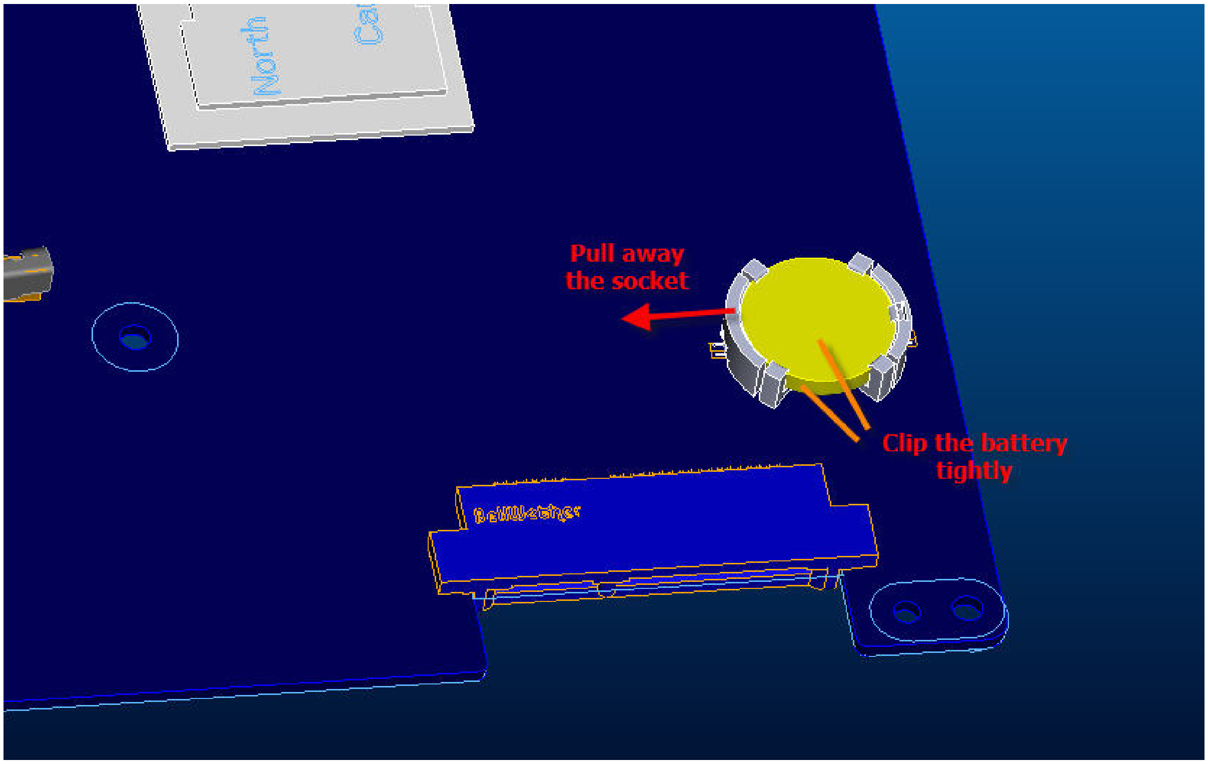


Figure 4-12-2 Remove the RTC battery-step_1

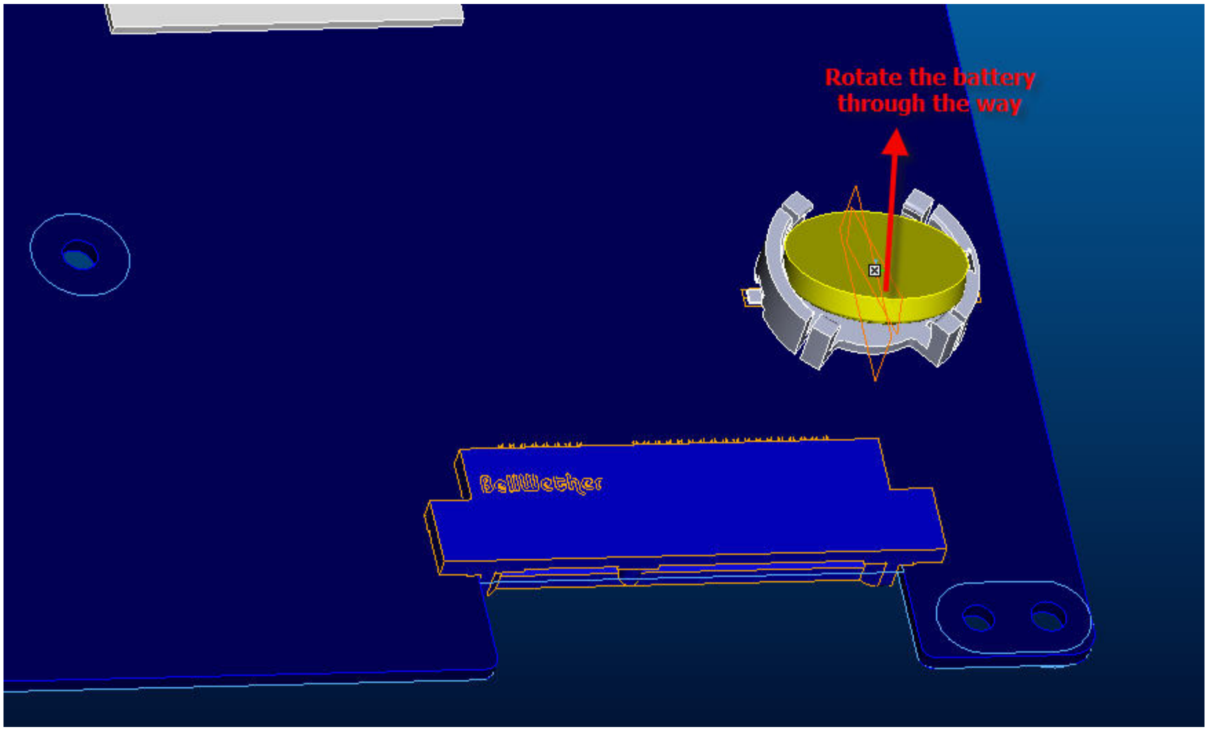


Figure 4-12-3 Remove the RTC battery-step_2

Installing RTC battery

The following describes the procedure for installing the RTC battery unit

(See Figure 4-12-4).

1. Press the force vertically then lock the RTC battery tightly.

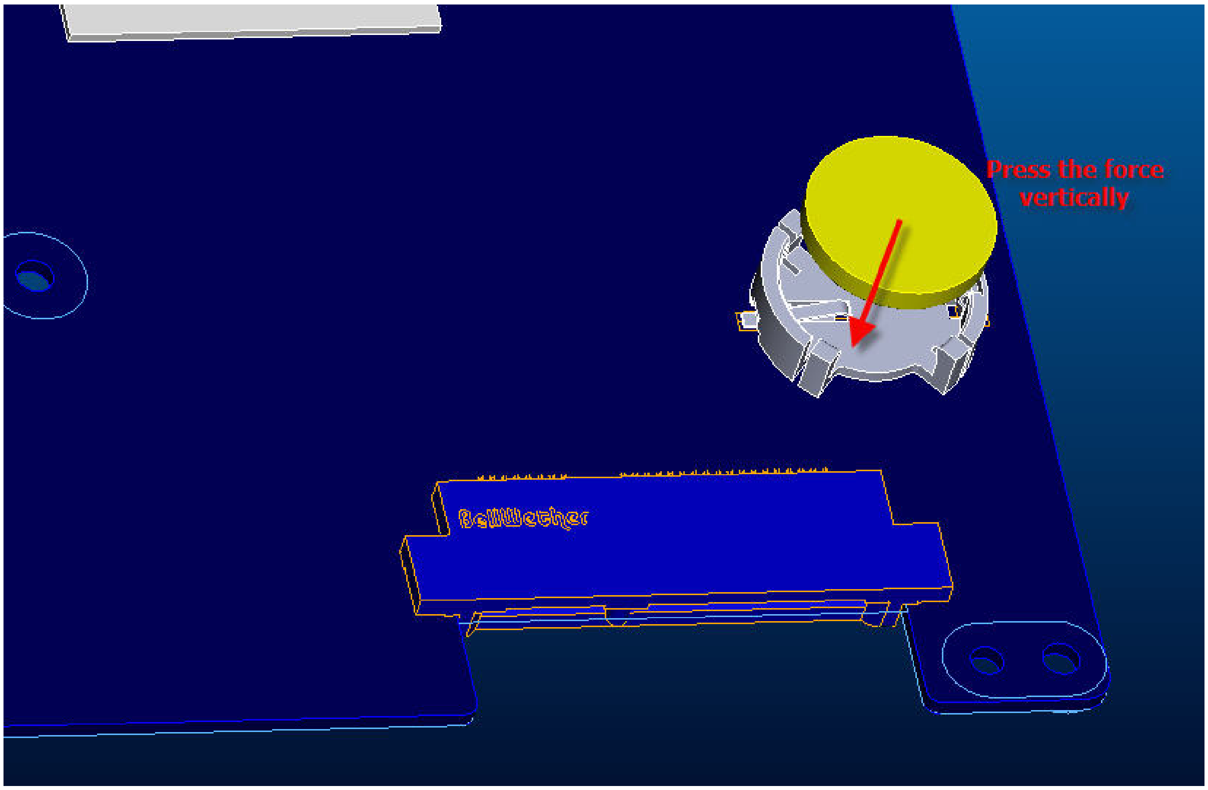


Figure 4-12-4 Install the RTC battery

4.13 CPU Heat Sink

Removing the CPU heat sink

The following describes the procedure for removing the CPU heat sink (See Figure 4-13-1).

1. Disconnect the **Heat sink cable** from the connector on the system board
2. Remove the following **screws** securing the heat sink holder along 1 to 3.

  - M2.0×2.5 screw x3

NOTE:	*When removing the heat sink holder, be sure to remove the screws in the reverse order of the number marked on the holder.*

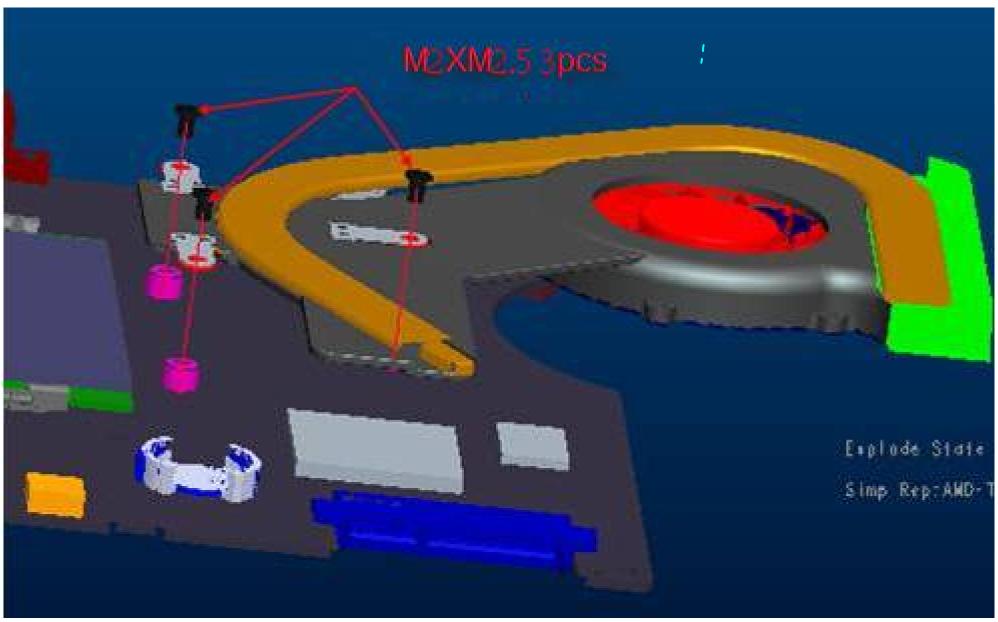


Figure 4-13-1 Remove the CPU heat sink

Installing the CPU heat sink

The following describes the procedure for installing the CPU heat sink

1. Secure the following **screws** securing the heat sink holder along 1 to 3.

    - M2.0×3.0 screw x3
    - Disconnect the **Heat sink cable** from the connector on the system board

2. Connect the **Heat sink cable** from the connector on the system board

4.14 LCD unit

Removing the LCD unit

The following describes the procedure for removing the LCD unit (See Figure 4-14-1 to 4-14-3).

1. Remove Screw MYLAR cover x4

2. Remove the following **screws** securing the display mask

   M2.0×5 screw x4

3. Insert your finger between the edge of the display mask and the LCD, and remove the display mask while releasing the latches of display mask. (Note: when removing the display mask, please first remove from top side to the bottom in order to lessen the degree of breaking.

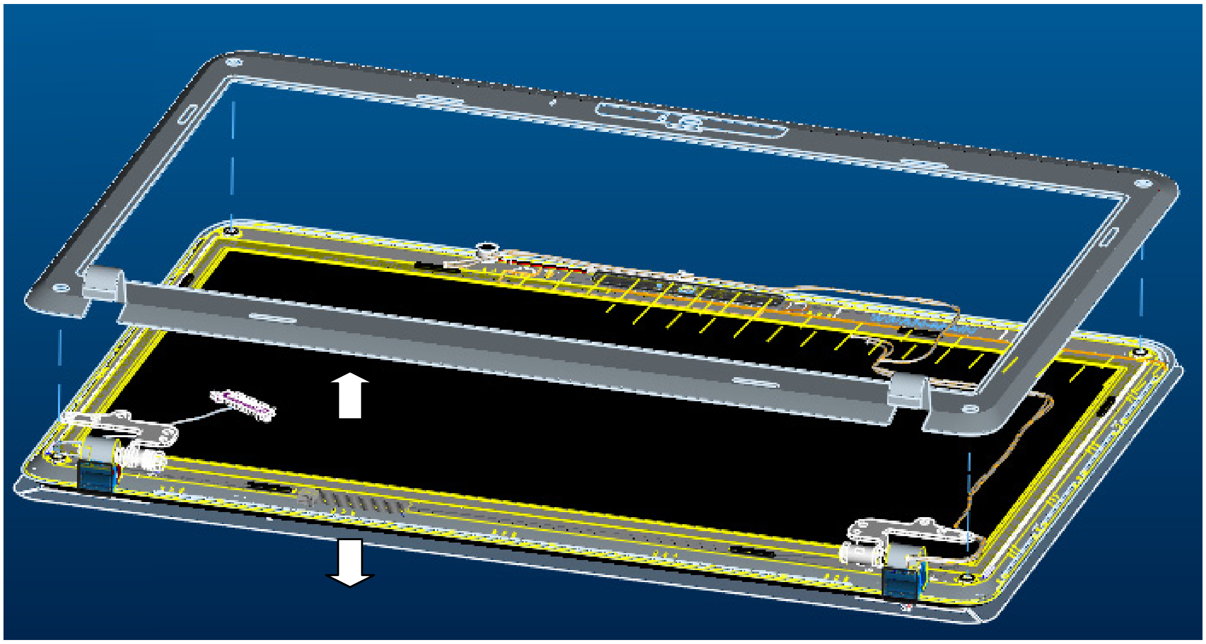


Figure 4-14-1 Remove the display mask

4. Remove the following **screws** securing the LCD unit.

   - M2.0x3.0 screw x4

5. With the bottom edge of the LCD unit on the display cover, lift only the top edge of the LCD unit. After peeling off the kapton **tape**, disconnect the LCD harness from the connector on the back of the LCD.

6. Remove the **LCD unit**.

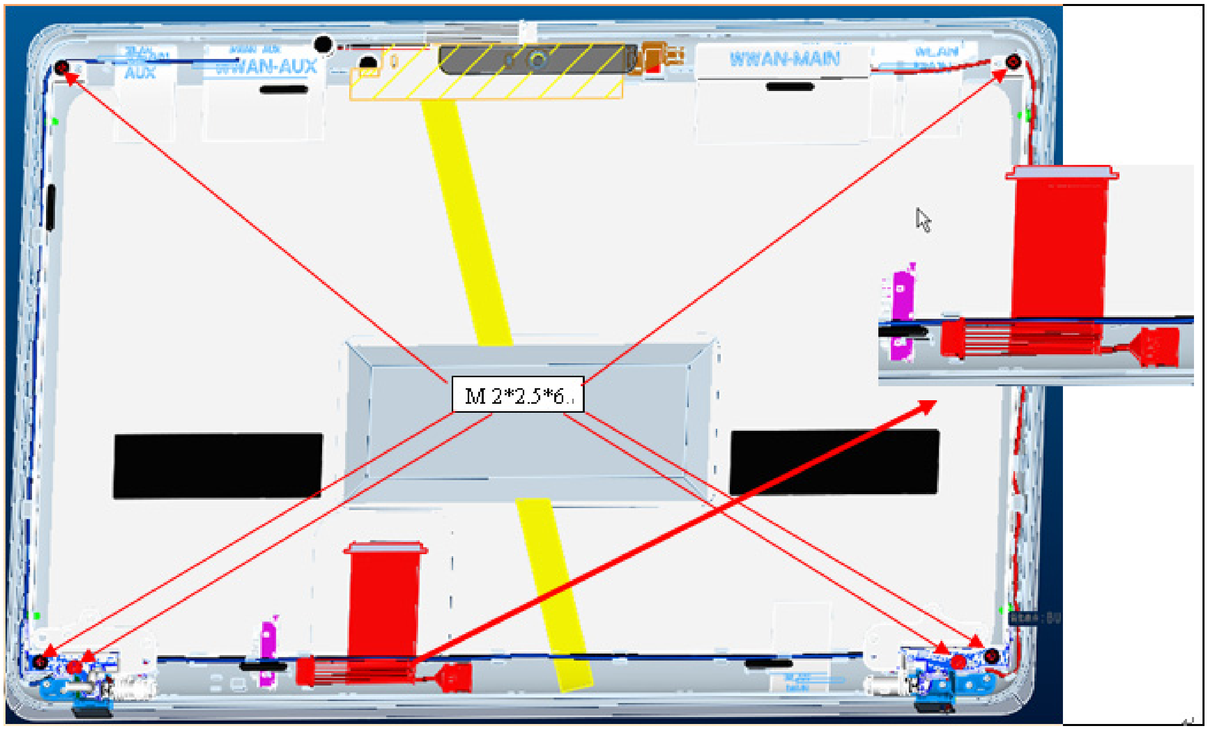


Figure 4-14-2 Remove the LCD unit

7. Remove the following **screws** securing the LCD support (LCD unit side) and remove the **hinge** from the LCD unit.

   - M2.0x2.5 screw x4

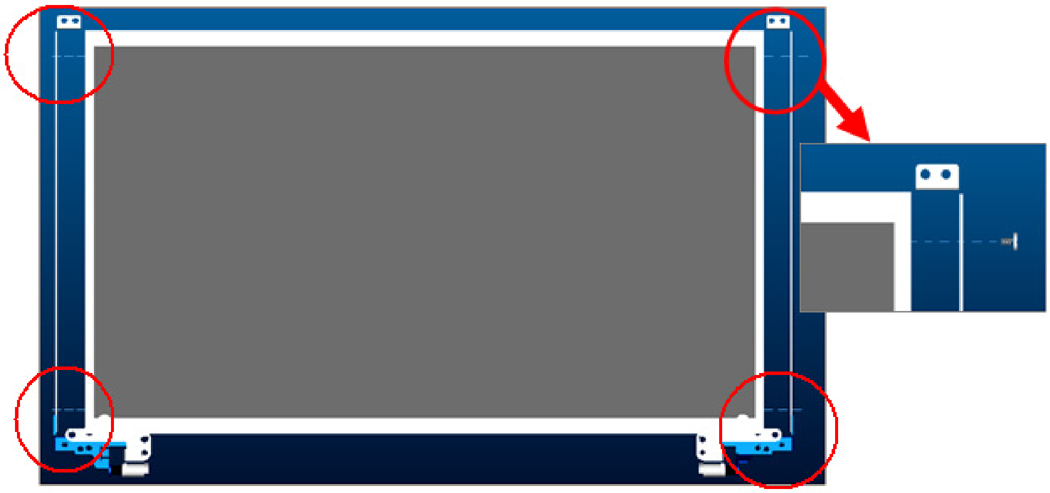


Figure 4-14-3 Remove the LCD hinge

Installing the LCD unit

The following describes the procedure for installing the LCD unit.

Install the LCD supports (LCD unit side) and hinge to the LCD and secure them with the following **screws**.

- M2.0×2.5 BINK screw x4

1. Stand the **LCD unit** on the display cover and connect the **LCD harness** to the connector on the back of LCD.
2. Stick the kapton **tape** on the connector of LCD harness.
3. Secure the LCD unit with the following **screws**.
   - M2.0x3.0 screw x6
4. Secure the display mask with following **screws**

   M2. 0×5 screw x4

5. Cover screws with Screw MYLAR cover x4

NOTE: *When installing the display mask, make sure there is no gap between the display mask and the display cover.*

4.15 Web Camera module

Removing Web Camera module

The following describes the procedure for removing the Web Camera module.

(See Figure 4-15-1 to 4-15-2).

1. Pull off the connector of Web Camera module.
2. Peel off the glue of Web Camera module.

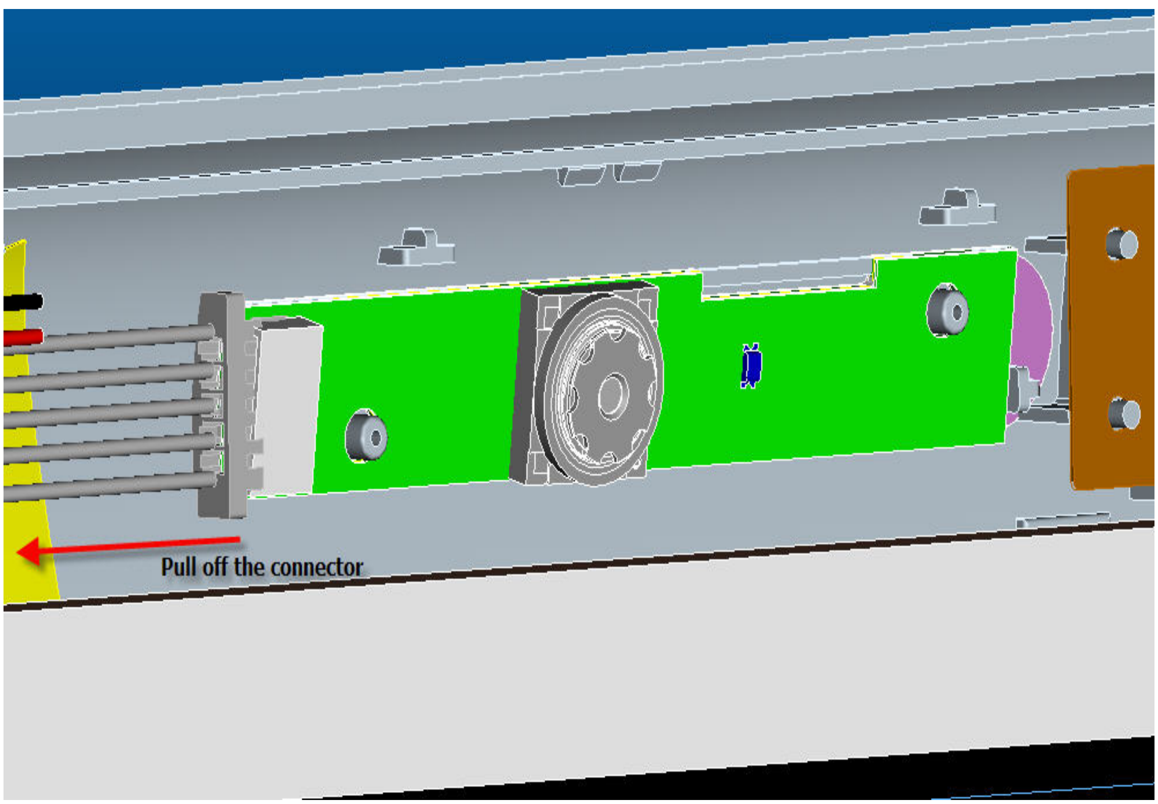


Figure 4-15-1 Remove the connector of Web Camera module

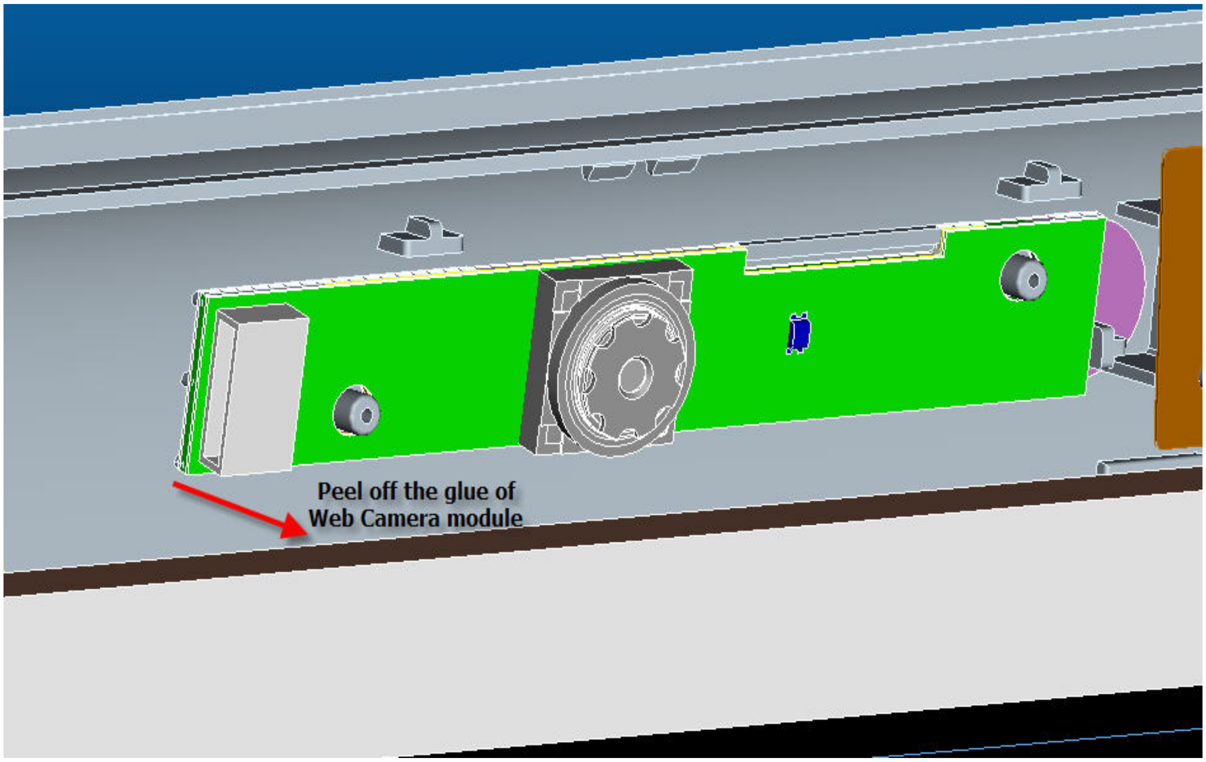


Figure 4-15-2 Peel off the glue of Web Camera module

Installing Web Camera module

The following describes the procedure for installing the Web Camera module.

1. Pull in the glue of Web Camera Module.
2. Connect the connector of Web Camera module.

4.16 Application for Thermal grease on CPU and North Bridge

(See Figure 4-16-1)

I. The thermal grease on North Bridge and CPU

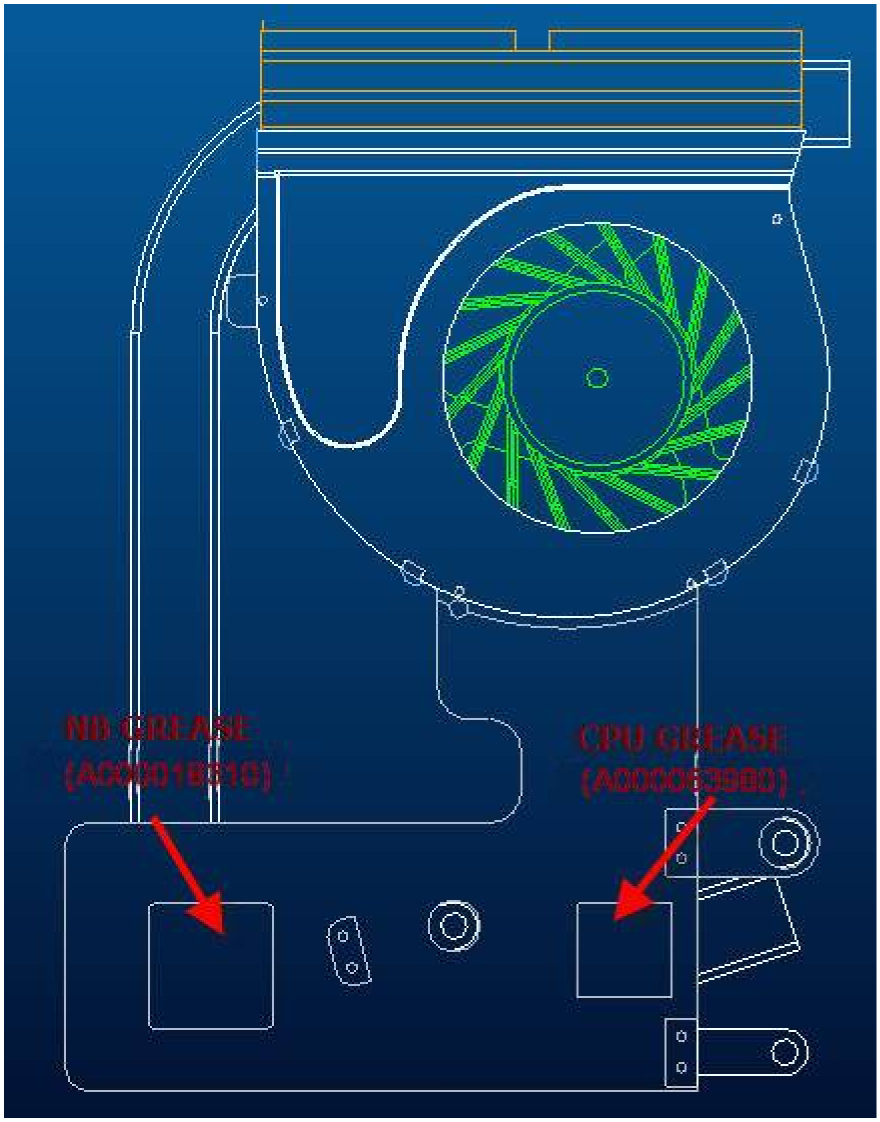


Figure 4-16-1 Intel &AMD Thermal grease on North Bridge and CPU

A000018310	THERMAL GREASE FCR-AS
A000063980	THERMAL GREASE 7762

II. Use grease on North Bridge and CPU

0.15cc for one repair.

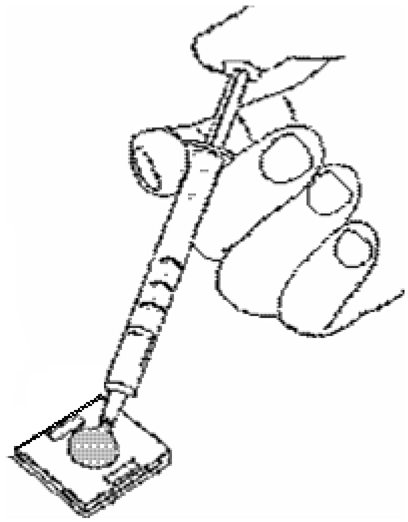


Figure 4-16-2 Apply silicon grease for North Bridge and CPU

4.17 Speaker Box

Removing Speaker Box

The following describes the procedure for removing Speaker Box. (See Figure 4-17-1 to 4-17-3).

1. Remove the following **screws** securing Speaker Box.
   - M2.0×2.5 screw x 4
2. Removing the Speaker Box.

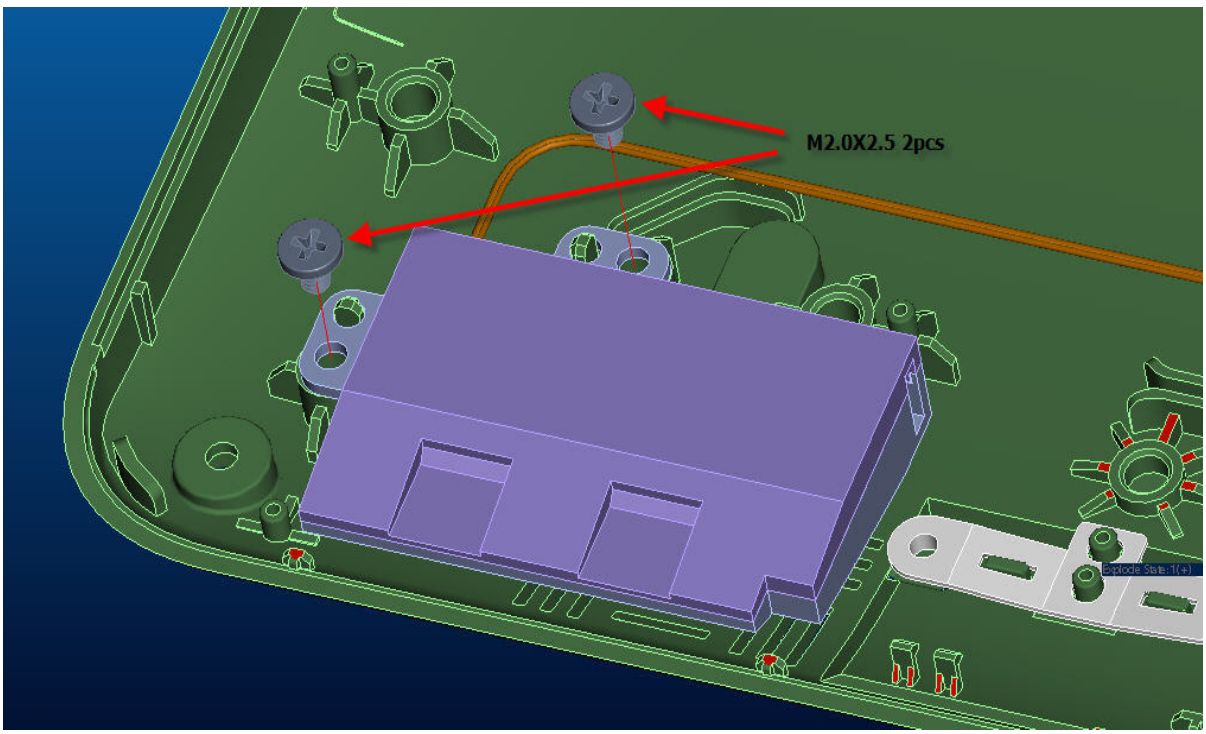


Figure 4-17-1 Removing the securing screws at left side.

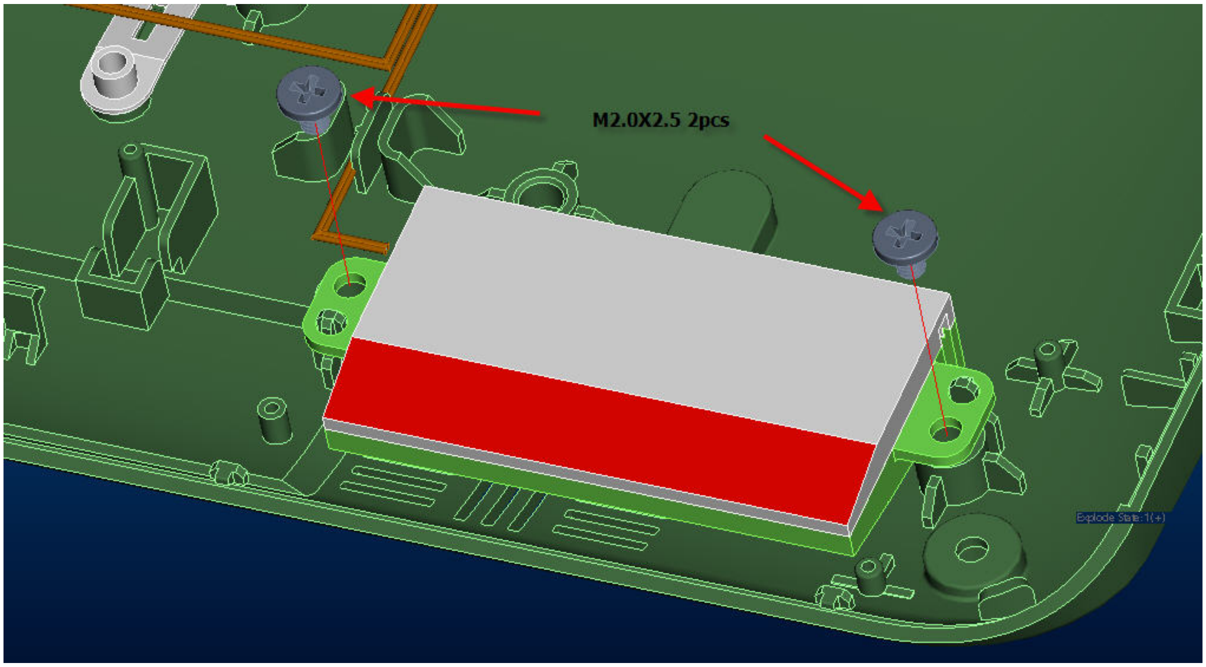


Figure 4-17-2 Removing the securing screws at right side

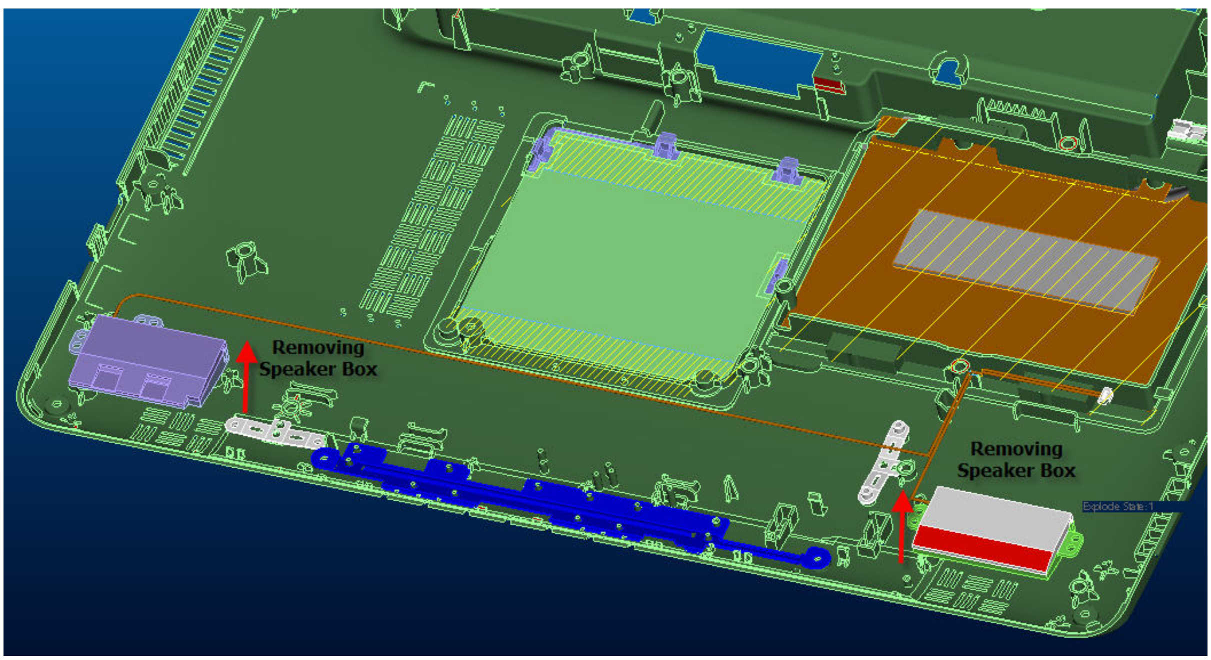


Figure 4-17-3 Removing the Speaker Box.

Installing Speaker Box

The following describes the procedure for installing Speaker Box.

1. Installing the Speaker Box.
2. Securing Speaker Box of following **screws**.
   - M2.0×2.5 screw x 4

Appendices

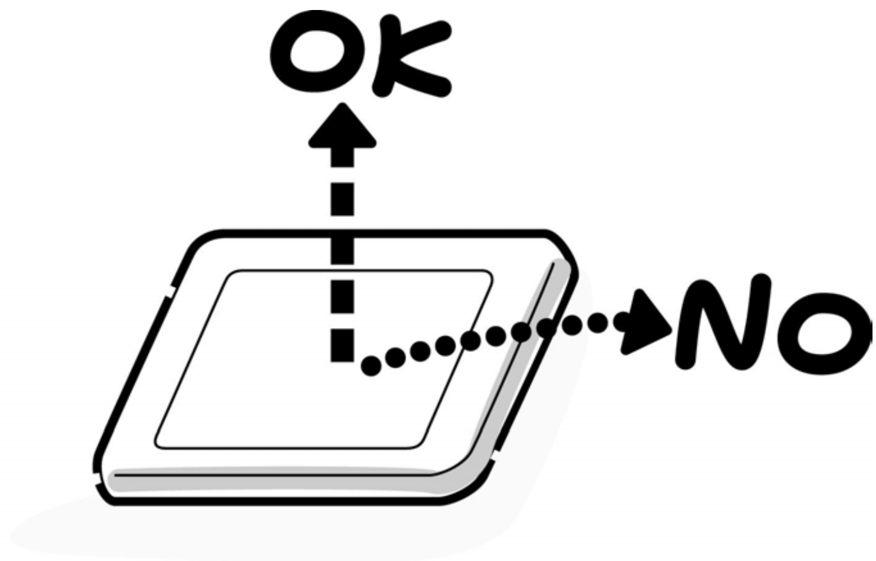
Appendix Contents

Appendix A Handling the LCD Module

Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

   Also, the panel's polarized surface is easily scarred, so be careful when handling it.





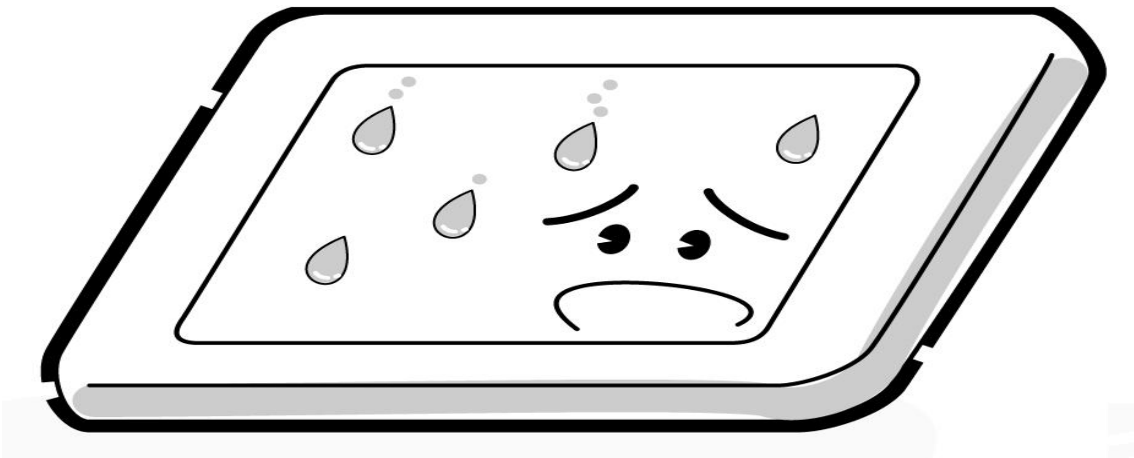
3. If the panel's surface gets fingerprint or dust, put on gloves and wipe it with static electricity cloth. If it is still dirty, drop some cleaning alcohol on the surface and wipe it again.

   If the surface is much more fingerprint or dust, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.

   If dust still exists, please use ionic FAN which can avoid static electricity to deal with it.



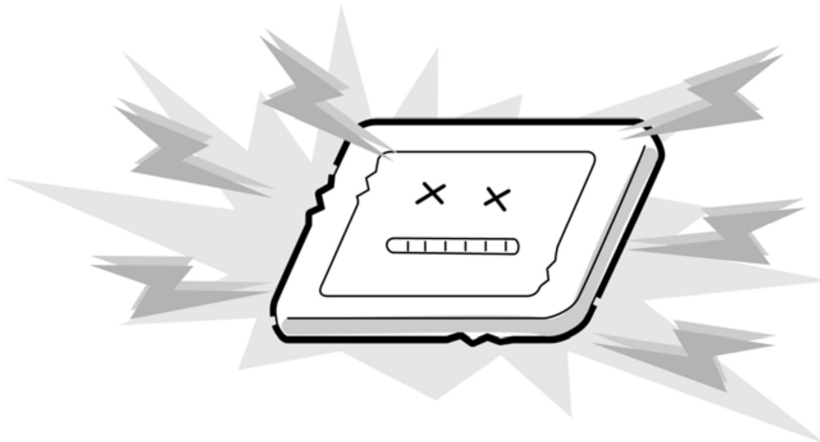
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid with cloth or ionic FAN



5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



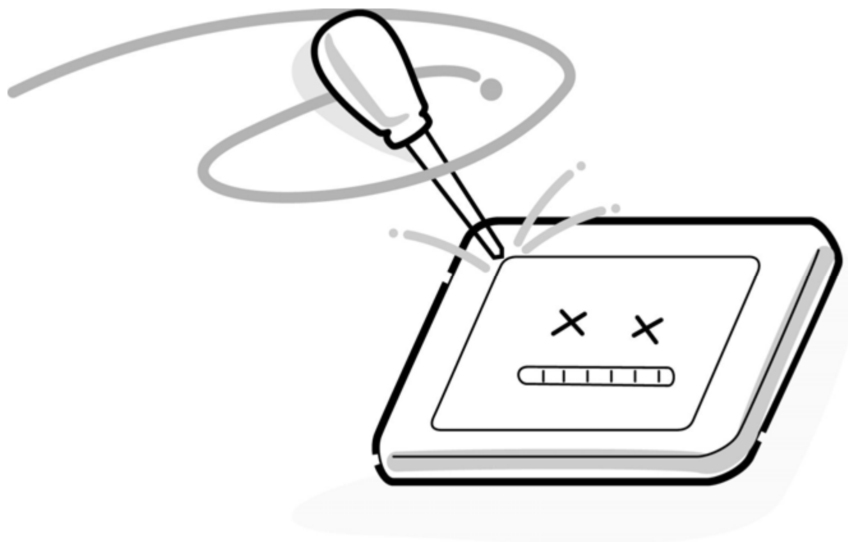
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



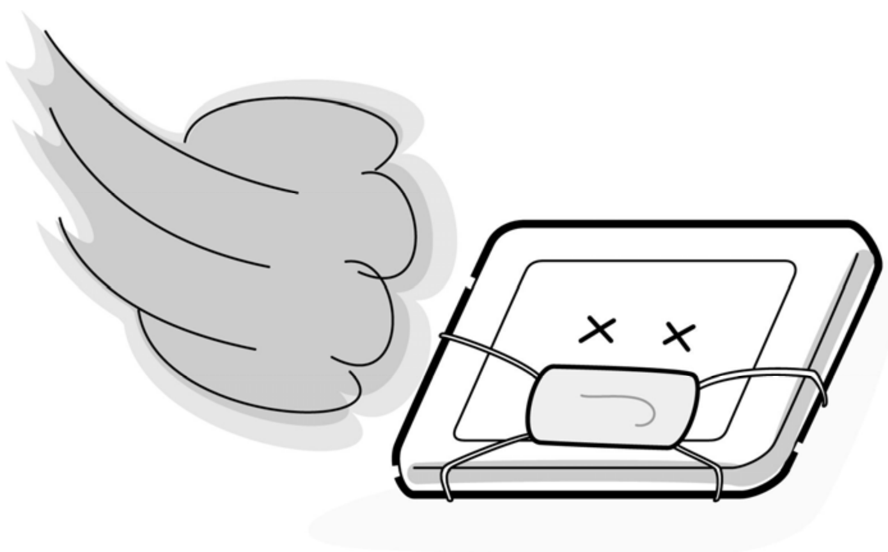
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxide). These materials can release gas that can damage the panel’s polarization.



Appendix B Board Layout

B.1 System Board

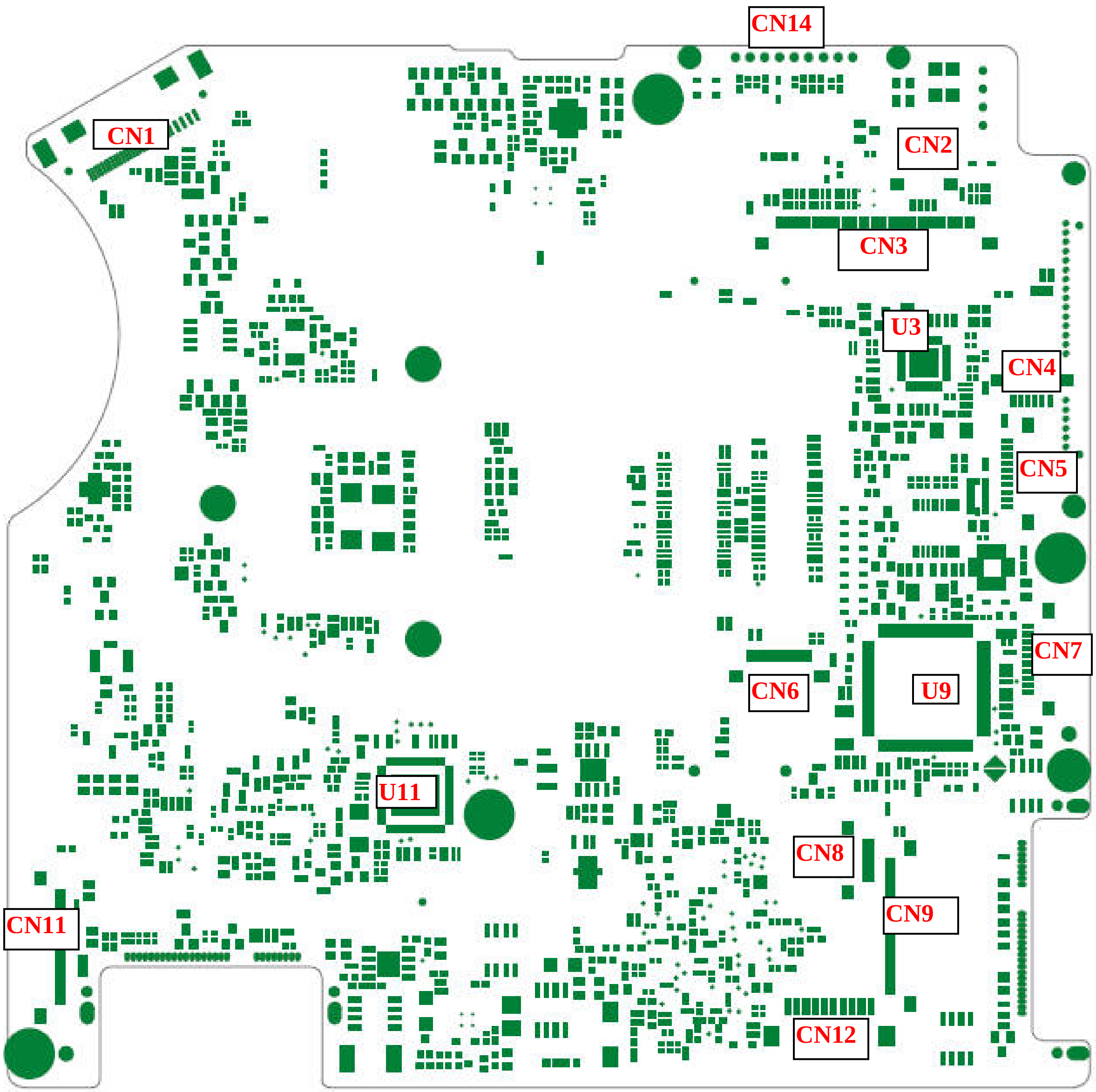


Figure B-1-1 System board layout (front)

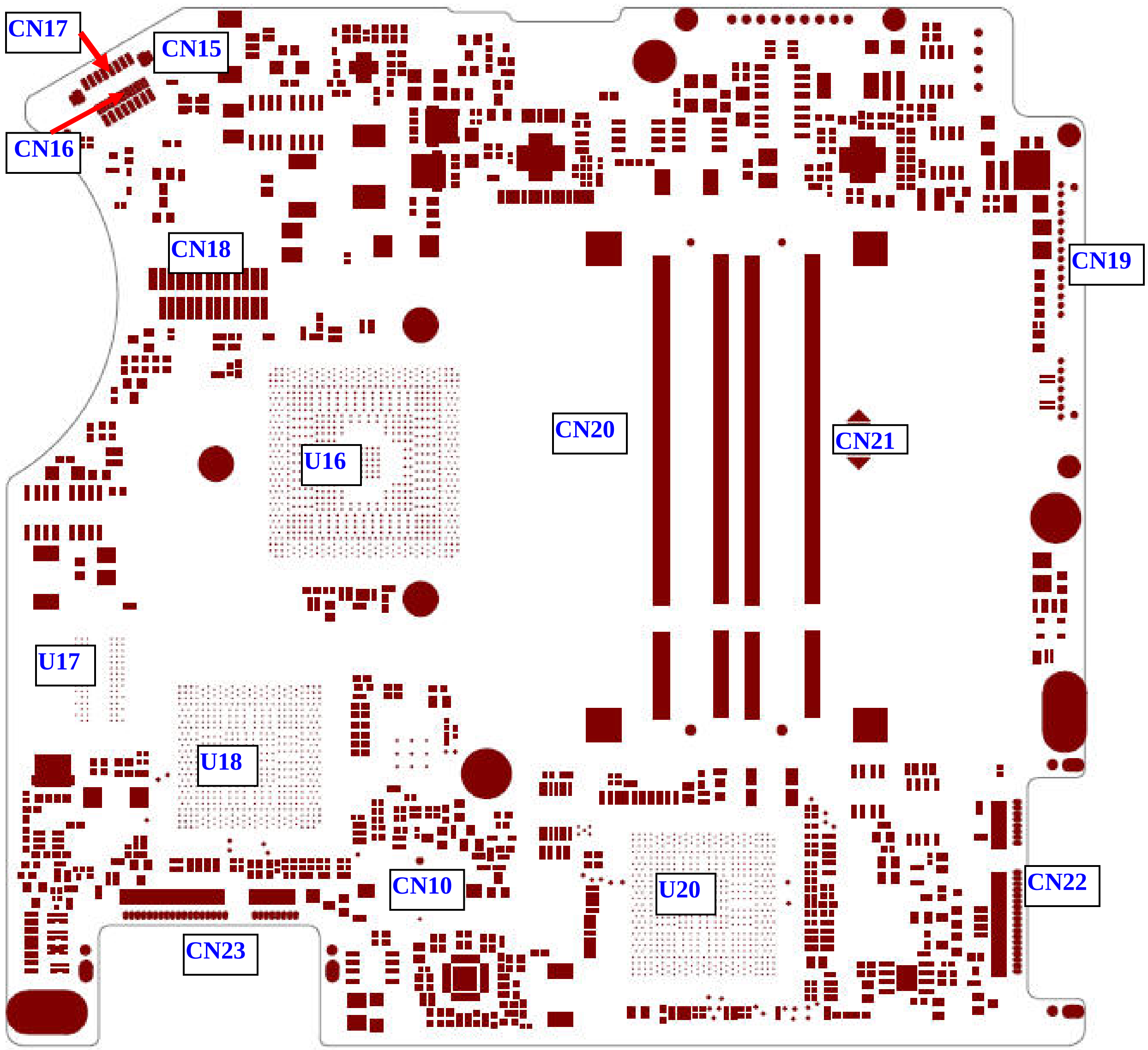


Figure B-1-2 System board layout (Back)

NUM	Location	Function
(01)	CN1	LVDS CONN
(02)	CN2	Power/B CONN
(03)	CN3	Key Board CONN
(04)	CN4	LAN CONN
(05)	CN5	11.6" SATA HDD CONN
(06)	CN6	TP/B CONN
(07)	CN7	SATA ODD CONN
(08)	CN8	SIM(3G)/B CONN
(09)	CN9	ADO+MMC/B CONN
(10)	CN10	RTC BATT CONN
(11)	CN11	HDMI/B CONN
(12)	CN12	Bluetooth CONN
(13)	CN14	BATT CONN
(14)	CN15	FAN CONN
(15)	CN16	CRT CONN
(16)	CN17	CRT CONN
(17)	CN18	HDT CONN
(18)	CN19	SATA HDD CONN
(19)	CN20	DDRII CONN
(20)	CN21	DDRII CONN
(21)	CN22	MINI Card Slot#2 (3G) CONN
(22)	CN23	MINI Card Slot#1 (WiFi) CONN
(23)	U3	LAN IC

(24)	**U9**	**Embedded Controller IC**
(25)	**U11**	**Clock generator**
(26)	**U16**	**CPU**
(27)	**U17**	**Memory Side Port**
(28)	**U18**	**North Bridge**
(29)	**U20**	**South Bridge**

Table B-1-3 System board ICs and connectors

B.2 Touch Pad Board

<Front layout>

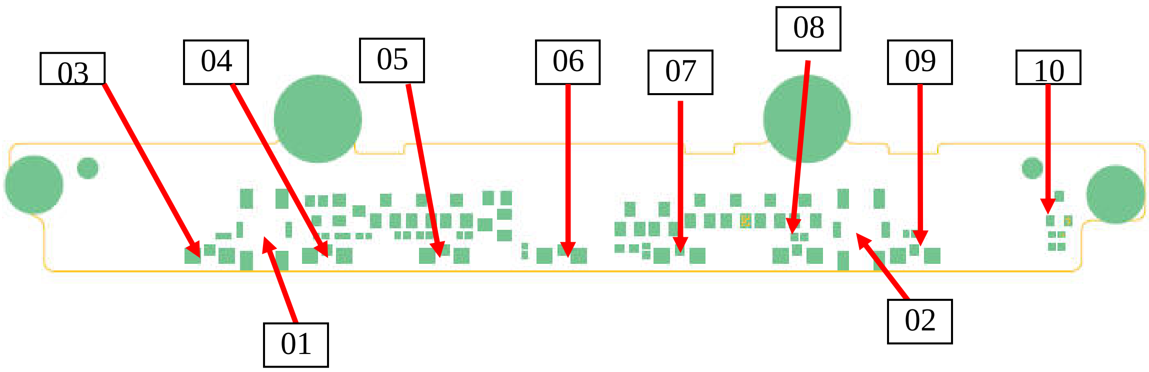


Figure B-2-1 Touch Pad board layout (Front)

NUM	Location	Function
(01)	SW1	Mouse Button Left key
(02)	SW2	Mouse Button Right key
(03)	LED1	AC-IN LED
(04)	LED2	POWER LED
(05)	LED3	BATT LED
(06)	LED4	HDD LED
(07)	LED5	Bridge Media LED
(08)	LED6	W-LAN LED
(09)	LED7	WiMAX/3G LED
(10)	LID	HALL Sensor

Table B-2-2 Touch Pad board connectors

<Back layout>

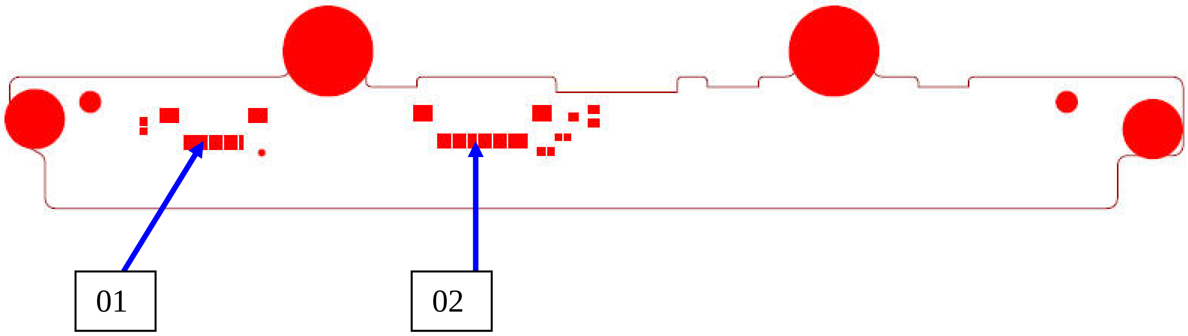


Figure B-2-3 Touch Pad board layout (Back)

NUM	Location	Function
(01)	CN2	TP Board to TP Module CONN
(02)	CN1	TP Board to M/B CONN

Table B-2-4 Touch Pad board connectors

B.3 CRT Board

<Front layout>

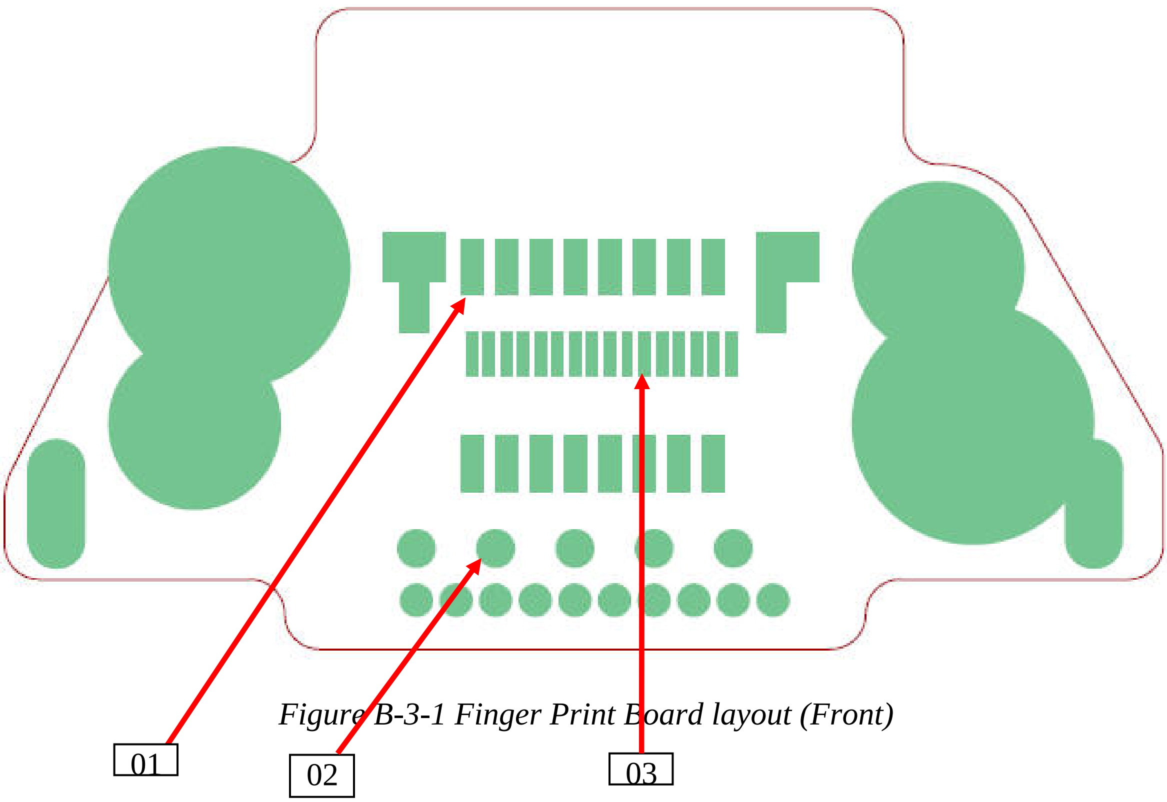


Figure B-3-1 Finger Print Board layout (Front)

NUM	Location	Function
(01)	CN1	CRT to M/B CONN
(02)	CN2	CRT CONN
(03)	CN3	CRT to M/B CONN

Table B-3-2 CRT Board connectors

<Back layout>

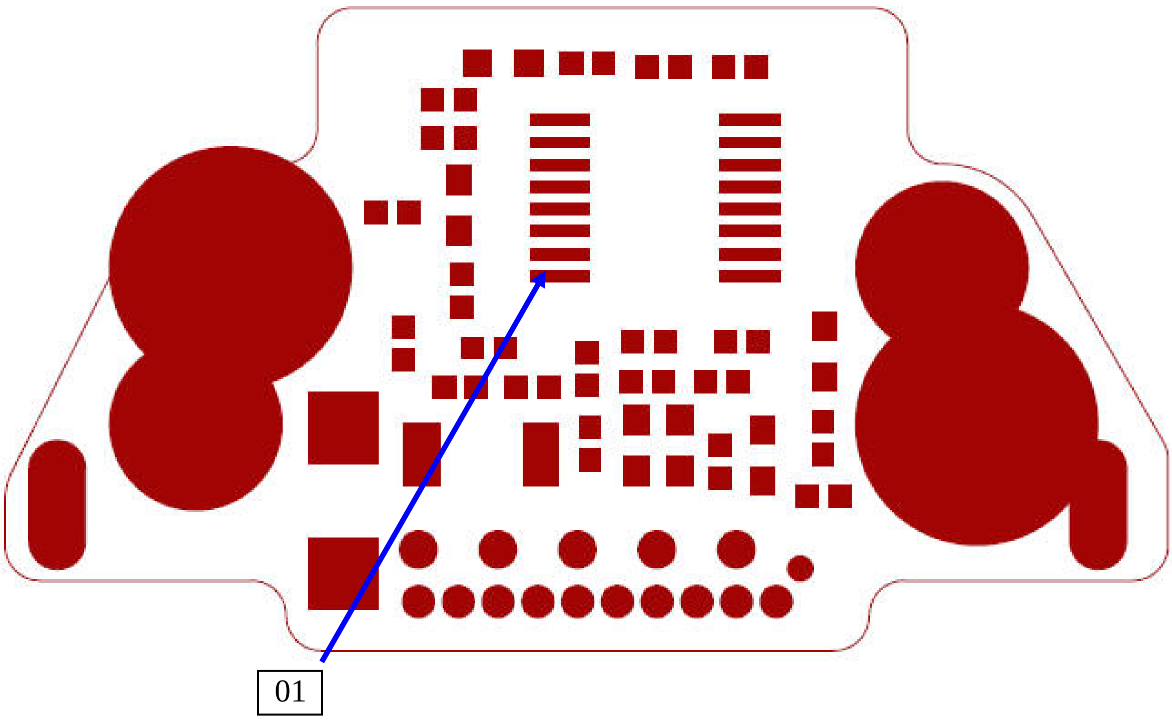


Figure B-3-3 CRT Board layout (Back)

NUM	Location	Function
(01)	U1	CRT ESD protection, level-shifting ,sync impedance matching IC

Table B-3-4 Finger Print Board connectors

B.4 Power Board

<Front layout>

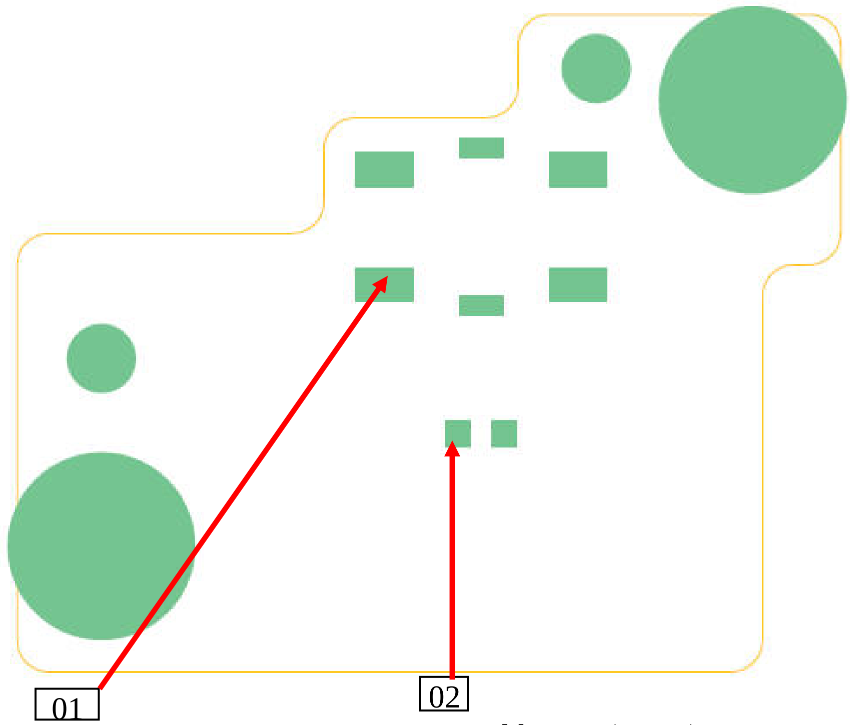


Figure B-4-1 Power Board layout (Front)

NUM	Location	Function
(01)	SW1	Power SW
(02)	LED1	Power LED

Table B-4-2 Power Board connectors

<Back layout>

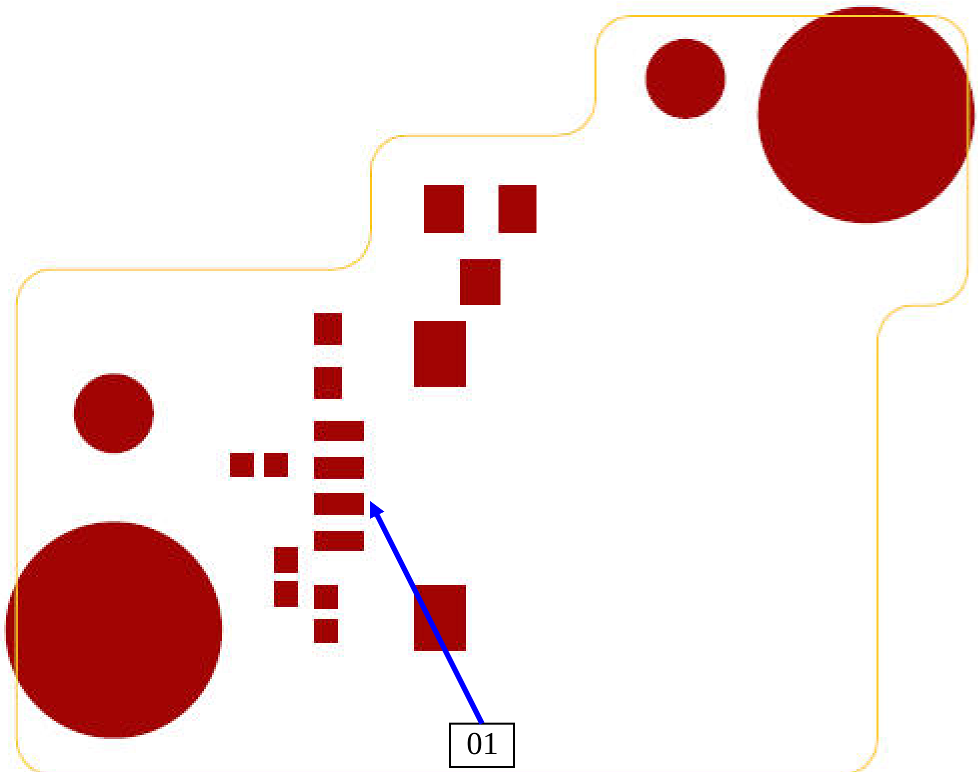


Figure B-4-3 Power Board layout (Back)

NUM	Location	Function
(01)	CN1	Power/B to M/B CONN

Table B-4-4 Power Board connectors

B.5 SIM (3G) Board

<Front layout>

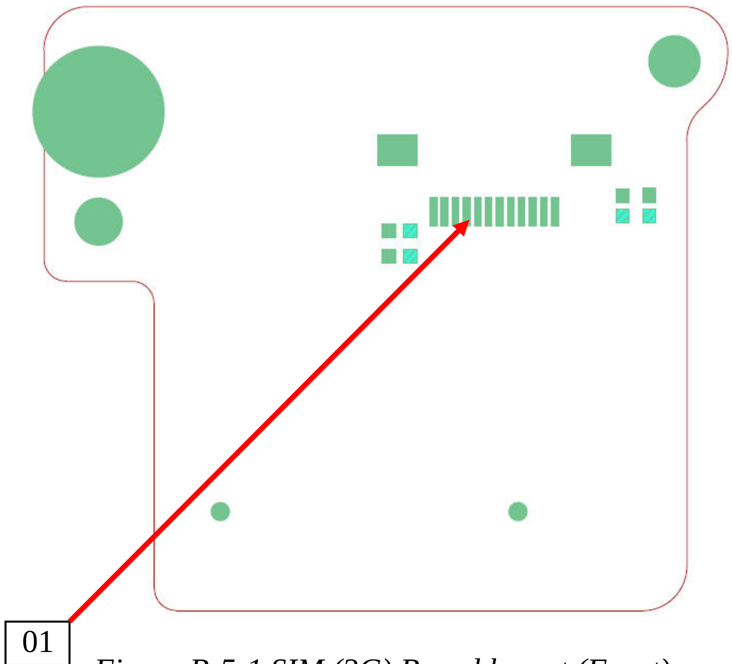


Figure B-5-1 SIM (3G) Board layout (Front)

NUM	Location	Function
(01)	CN1	SIM(3G)/B to M/B CONN

Table B-5-2 SIM (3G) Board connectors

<Back layout>

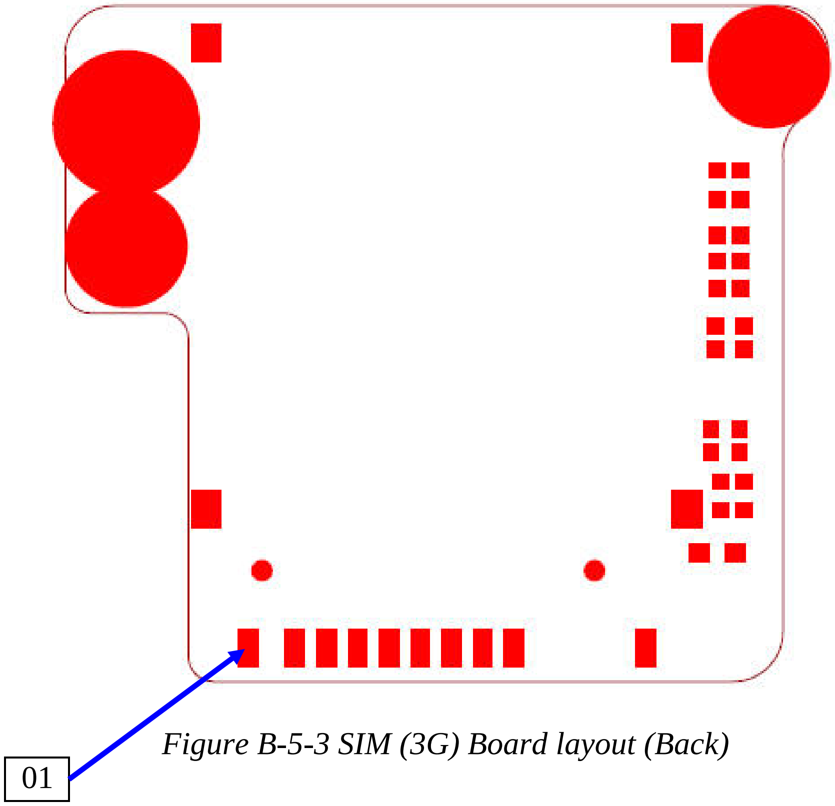


Figure B-5-3 SIM (3G) Board layout (Back)

NUM	Location	Function
(01)	JSIM1	SIM Card CONN

Table B-5-4 SIM (3G) Board connectors

B.6 HDMI Board

<Front layout>

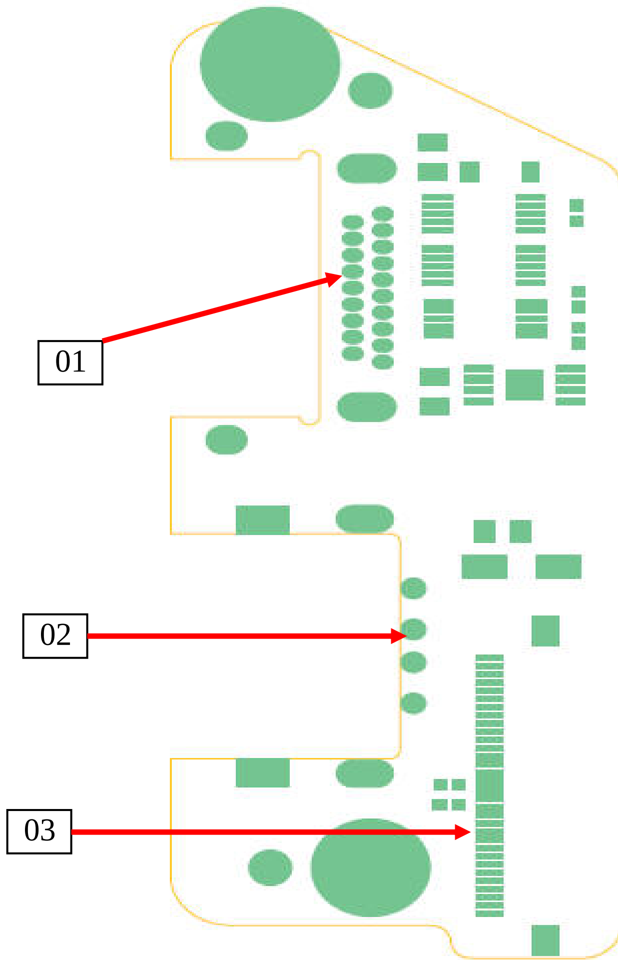


Figure B-6-1 HDMI Board layout (Front)

NUM	Location	Function
(01)	CN1	HDMI CONN
(02)	CN2	USB CONN
(03)	CN3	HDMI/B to M/B CONN

Table B-6-2 HDMI Board connectors

<Back layout>

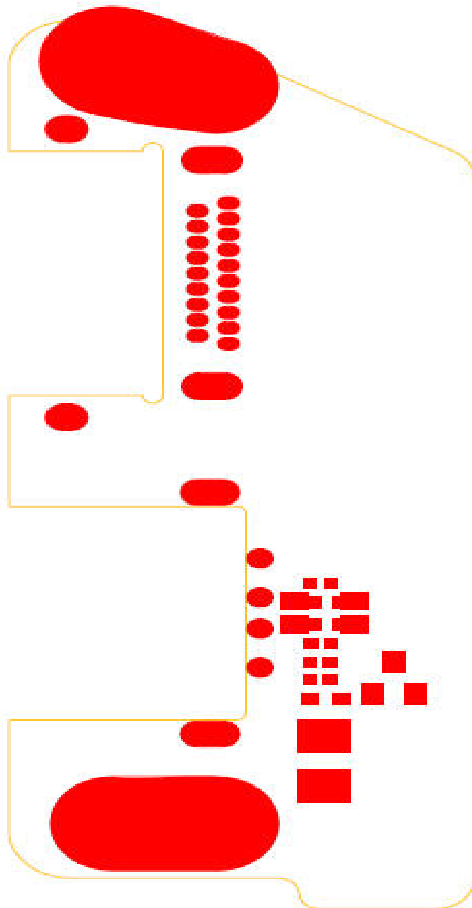


Figure B-6-3 HDMI Board layout (Back)

B.7 ADO+MMC Board

<Front layout>

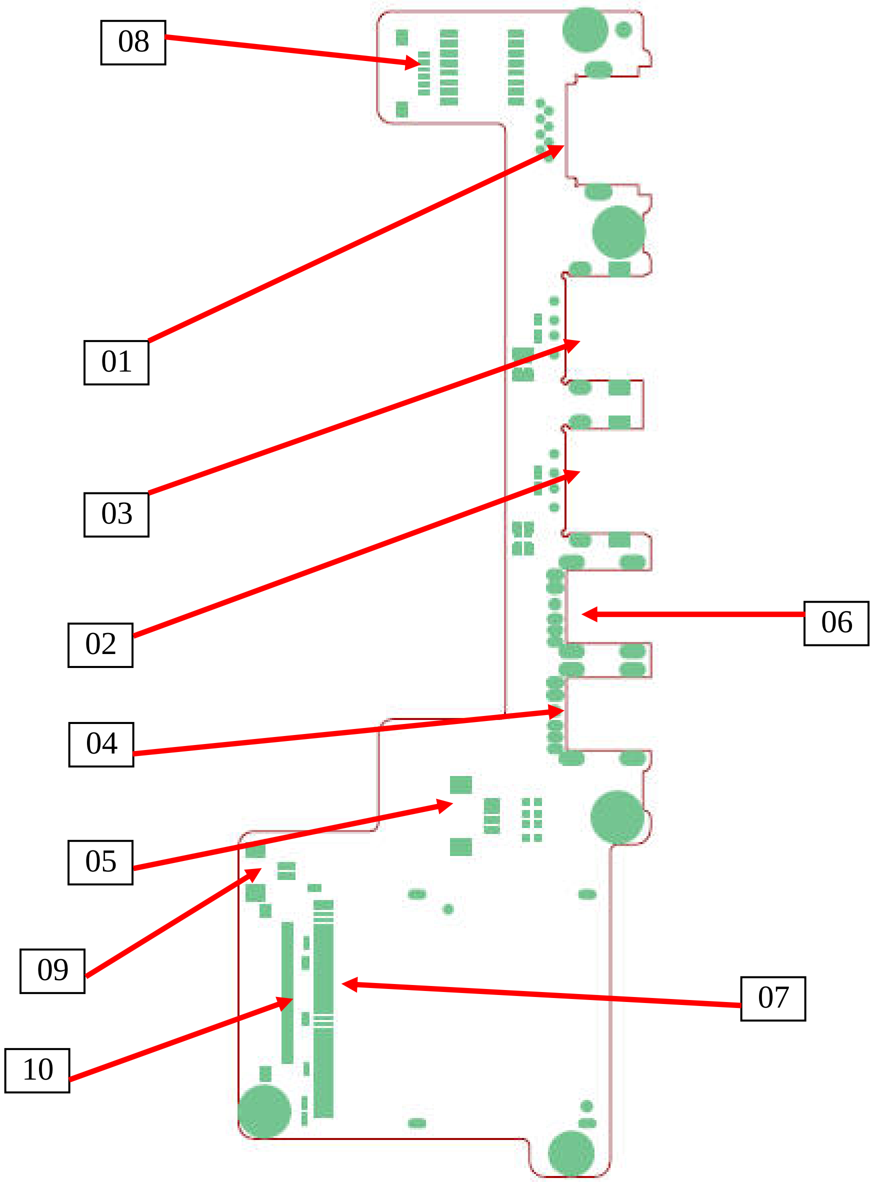


Figure B-7-1 ADO+MMC Board layout (Front)

NUM	Location	Function
(01)	CN1	RJ45 CONN
(02)	CN4	USB CONN
(03)	CN5	USB CONN
(04)	CN6	Earphone CONN
(05)	CN7	Inner Speaker CONN
(06)	CN8	External MIC CONN
(07)	CN9	5 IN 1 Card Reader CONN
(08)	CN10	Inner Speaker CONN
(09)	CN11	Reserved MIC CONN
(10)	CN4501	ADO+MMC Board to M/B CONN

Table B-7-2 ADO+MMC Board connectors

<Back layout>

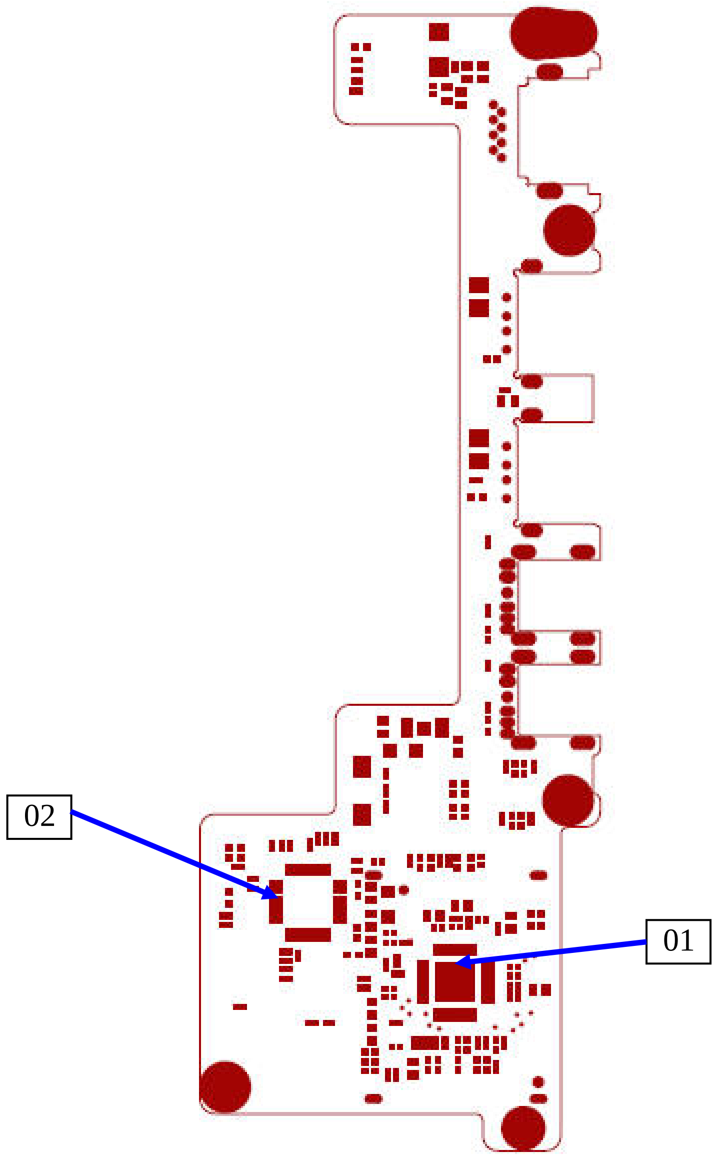


Figure B-7-3 ADO+MMC Board layout (Back)

NUM	Location	Function
(01)	U4	Codec IC
(02)	U5	Carder Reader IC

Table B-7-4 ADO+MMC Board IC

Appendix C Pin Assignment

CN1 LCD Panel Connectors

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	VIN	---	2	VIN	---
3	LCDVCC	---	4	LCDVCC	---
5	+3V	---	6	CCD_POWER	---
7	MIC_GND	---	8	INT_MIC_R	I/O
9	GND	---	10	GND	---
11	USBP10-_LCD	I/O	12	USBP10+_LCD	I/O
13	GND	---	14	LCD_DDCCLK	I/O
15	LCD_DDCDAT	I/O	16	GND	---
17	INT_TXLCLKOUT-	I/O	18	INT_TXLCLKOUT+	I/O
19	GND	---	20	INT_TXLOUT2-	I/O
21	INT_TXLOUT2+	I/O	22	GND	---
23	INT_TXLOUT1-	I/O	24	INT_TXLOUT1+	I/O
25	GND	---	26	INT_TXLOUT0-	I/O
27	INT_TXLOUT0+	I/O	28	GND	---
29	LVDS_VADJ	I/O	30	DISPON	---

CN2 Power/B Connector

PIN No.	**Signal name**	**I/O**	**PIN No.**	**Signal name**	**I/O**
1	+3VPCU	---	2	NBSWON#	---
3	PWR/B_LED#_Q	I	4	GND	---

CN3 Keyboard Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	K_LED_P	---	2	MY16	O
3	---	---	4	MX17	O
5	---	---	6	K_LED_P	---
7	MY2	O	8	MY1	O
9	MY0	O	10	MY4	O
11	MY3	O	12	MY5	O
13	MY14	O	14	MY6	O
15	MY7	O	16	MY13	O
17	MY8	O	18	MY9	O
19	MY10	O	20	MY11	O
21	MY12	O	22	MY15	O
23	MX7	O	24	MX2	O
25	MX3	O	26	MX4	O
27	MX0	O	28	MX5	O
29	MX6	O	30	MX1	O
31	K_LED_P	O	32	CAPSLED	O
33	FN_F10	O	34	NUMLED	O

CN4 LAN Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	AVDD_CEN	---	2	TX1P	---

3	TX1N	---	4	GND	---
5	TX0P	---	6	TX0N	---

CN5 SATA HDD Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	SATA_TXP0	O
3	SATA_TXN0	O	4	GND	---
5	SATA_RXN0	I	6	SATA_RXP0	I
7	GND	---	8	NC	---
9	+5V	---	10	+5V	---

CN6 Touchpad Board Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	GND	---
3	GND	---	4	LID591#	I/O
5	TPCLK	I/O	6	TPDATA	I/O
7	MMC_LED#	O	8	3G_LED#	O
9	RF_LED	O	10	SATA_LED#_C	O
11	BAT_SAT1	O	12	BAT_SAT0	O
13	SUSLED_EC	O	14	PWRLED#	O
15	ACIN	---	16	+3V	---
17	+3VPCU	---	18	+5V	---

CN8 SIM(3G)/B Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	UIM_CLK	I/O
3	GND	---	4	UIM_DATA	O
5	GND	---	6	UIM_RST	O
7	UIM_VPP	O	8	UIM_PWR	O
9	GND	---	10	USBP6+	I/O
11	USBP6-	I/O	12	GND	---

CN9 ADO+MMC Board Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	ACZ_SDIN0	O	2	ACZ_SDOUT_AUDIO	I/O
3	GND	---	4	ACZ_SYNC_AUDIO	I
5	ACZ_RST#_AUDIO	I	6	GND	---
7	BIT_CLK_AUDIO	I/O	8	GND	---
9	MIC_GND	O	10	INT_MIC_R	O
11	GND	---	12	SPKR	O
13	AMP_MUTE#	I	14	USBOC#0	O
15	GND	---	16	USBP1+	I/O
17	USBP1-	I/O	18	GND	---
19	USBP0+	I/O	20	USBP0-	I/O
21	GND	---	22	USB_EN#0_1	I
23	+3V	---	24	NC	---

25	+3V	---	26	NC	---
27	+5V	---	28	+5V	---
29	+5V	---	30	+5VPCU	---
31	+5VPCU	---	32	+5VPCU	---
33	+5VPCU	---	34	+5VPCU	---
35	NC	---	36	MMC_LED#	I/O
37	PLTRST#	I	38	GND	---
39	USBP11+	I/O	40	USBP11-	I/O

CN10 RTC Battery Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TERM12	I	2	GND	---

CN11 HDMI Board Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NC	---	2	NC	---
3	GND	---	4	NC	---
5	+3V	---	6	+5VPCU	---
7	+5VPCU	---	8	+5VPCU	---
9	+5VPCU	---	10	+5V	---
11	NC	---	12	BUSBP3-	I/O
13	BUSBP3+	I/O	14	GND	---
15	USB_SLEEP_OC#	---	16	USB_SLEEP_EN#	O
17	BOARD_ID2	I/O	18	HDMI_CON_HP	I/O

19	HDMI_CON_DDCDATA	I/O	20	HDMI_CON_DDCCLK	O
21	GND	---	22	HDMICLKN	O
23	HDMICLKP	O	24	GND	---
25	HDMITX0N	O	26	HDMITX0P	O
27	GND	---	28	HDMITX1N	O
29	HDMITX1P	O	30	GND	---
31	HDMITX2N	O	32	HDMITX2P	O

CN12 Blue Tooth Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	USBP9+	I/O
3	USBP9-	I/O	4	WCS_CLK	O
5	GND	---	6	BT_RESET	O
7	WCS_DAT	O	8	+3V	---
9	BT_EN	O	10	GND	---

CN14 Battery Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	GND	---
3	MBCLK	I/O	4	MBDATA	I/O
5	TEMP_MBAT	O	6	GND	---
7	ID	O	8	MBAT+	---
9	MBAT+	---	10	GND	---
11	GND	---			

CN15 FAN Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TH_FAN_POWER1	---	2	GND	---
3	FANSIG1	O			

CN16 CRT Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5V	---	2	+3V	
3	NC	---	4	NC	---
5	GND	---	6	DDCDAT	I/O
7	VSYNC	---	8	DDCCLK	O
9	HSYNC	---	10	GND	---
11	GND	---	12	CRT_R	O
13	CRT_G	O	14	GND	---
15	GND	---	16	CRT_B	O

CN17 CRT Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	DDCDAT	I/O
3	DDCCLK	O	4	GND	---
5	VSYNC	---	6	HSYNC	---
7	GND	---	8	CRT_B	O

9	GND	---	10	CRT_G	O
11	GND	---	12	CRT_R	O
13	GND	---	14	NC	---
15	+3V	---	16	+5V	---

CN18 HDT Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	GND	---
3	CPU_LDT_RST#	O	4	GND	---
5	CPU_PWRGD	---	6	GND	---
7	CPU_DBREQ#	O	8	GND	---
9	CPU_DBRDY	O	10	GND	---
11	CPU_TCK	O	12	GND	---
13	CPU_TMS	O	14	GND	---
15	CPU_TDI	O	16	GND	---
17	CPU_TRST#	O	18	GND	---
19	CPU_TDO	O	20	GND	---
21	+1.8VSUS	---	22	GND	---
23	+1.8VSUS	---	24	GND	---
25	GND	---	26		

CN19 Main SATA HDD Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	SATA_TXP0	O

3	SATA_TXN0	O	4	GND	---
5	SATA_RXN0	I	6	SATA_RXP0	I
7	GND	---	8	+3.3VSATA1	---
9	+3.3VSATA1	---	10	+3.3VSATA1	---
11	GND	---	12	GND	---
13	GND	---	14	+5V	---
15	+5V	---	16	+5V	---
17	GND	---	18	NC	---
19	GND	---	20	NC	---
21	NC	---	22	NC	---
23	GND	---	24	GND	---

CN20 DDR Connector

PI N No.	**Signal name**	**I/O**	**PIN No.**	**Signal name**	**I/O**
1	*SMDDR_VREF_DIMM*	---	*2*	*GND*	---
3	*GND*	---	*4*	*MEM_MA_DATA1*	*I/O*
5	*MEM_MA_DATA5*	*I/O*	*6*	*MEM_MA_DATA0*	*I/O*
7	*MEM_MA_DATA4*	*I/O*	*8*	*GND*	---
9	*GND*	---	*10*	*MEM_MA _DM0*	*I*
11	*MEM_MA_DQS0_N*	*I/O*	*12*	*GND*	---
13	*MEM_MA _DQS0_P*	*I/O*	*14*	*MEM_MA_DATA6*	*I/O*
15	*GND*	---	*16*	*MEM_MA_DATA7*	*I/O*
17	*MEM_MA_DATA2*	*I/O*	*18*	*GND*	---
19	*MEM_MA_DATA3*	*I/O*	*20*	*MEM_MA_DATA12*	*I/O*

21	GND	---	22	MEM_MA_DATA13	I/O
23	MEM_MA_DATA8	I/O	24	GND	---
25	MEM_MA_DATA9	I/O	26	MEM_MA_DM1	I
27	GND	---	28	GND	---
29	MEM_MA _DQS1_N	I/O	30	MEM_MA _CLK1_P	I/O
31	MEM_MA _DQS1_P	I/O	32	MEM_MA _CLK1_N	I/O
33	GND	---	34	GND	---
35	MEM_MA_DATA14	I/O	36	MEM_MA_DATA15	I/O
37	MEM_MA_DATA11	I/O	38	MEM_MA_DATA10	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	MEM_MA_DATA16	I/O	44	MEM_MA_DATA17	I/O
45	MEM_MA_DATA17	I/O	46	MEM_MA_DATA20	I/O
47	GND	---	48	GND	---
49	MEM_MA _DQS2_N	I/O	50	MEMHOT_DIMM#_1	O
51	MEM_MA _DQS2_P	I/O	52	MEM_MA_DM2	I/O
53	GND	---	54	GND	---
55	MEM_MA_DATA19	I/O	56	MEM_MA_DATA22	I/O
57	MEM_MA_DATA18	I/O	58	MEM_MA_DATA23	I/O
59	GND	---	60	GND	---
61	MEM_MA_DATA27	I/O	62	MEM_MA_DATA29	I/O
63	MEM_MA_DATA26	I/O	64	MEM_MA_DATA31	I/O
65	GND	---	66	GND	---
67	MEM_MB_DM3	I/O	68	MEM_MB_DQS3_N	I/O
69	MEM_MB_RESET#2	I/O	70	MEM_MB_DQS3_P	I/O

71	GND	---	72	GND	---
73	MEM_MB_DATA30	I/O	74	MEM_MB_DATA27	I/O
75	MEM_MB_DATA31	I/O	76	MEM_MB_DATA26	I/O
77	GND	---	78	GND	---
79	MEM_MB_CKE0	I	80	MEM_MB_CKE1	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	NC	---	84	MEM_MB_ADD15	I
85	MEM_MA_BANK2	I	86	MEM_MB_ADD14	I
87	+1.8VSUS	---	88	+1.8VSUS	---
89	MEM_MB_ADD12	I	90	MEM_MB_ADD11	I
91	MEM_MB_ADD9	I	92	MEM_MB_ADD7	I
93	MEM_MB_ADD8	I	94	MEM_MA_ADD6	I
95	+1.8VSUS	---	96	+1.8VSUS	I
97	MEM_MB_ADD5	I	98	MEM_MB_ADD4	I
99	MEM_MB_ADD3	I	100	MEM_MB_ADD2	I
101	MEM_MB_ADD1	I	102	MEM_MB_ADD0	I
103	+1.8VSUS	---	104	+1.8VSUS	---
105	MEM_MB_ADD10	I	106	MEM_MB_BANK1	I
107	MEM_MB_BANK0	I	108	MEM_MB_RAS#	I
109	MEM_MB_WE#	I	110	MEM_MB0_CS#0	I
111	+1.8VSUS	---	112	+1.8VSUS	---
113	MEM_MB_CAS#	I	114	MEM_MB0_ODT0	I
115	MEM_MB0_CS#1	I	116	MEM_MB_ADD13	I
117	+1.8VSUS	---	118	+1.8VSUS	---
119	MEM_MB0_ODT1	I	120	NC	---
121	GND	---	122	GND	---

123	MEM_MA_DATA37	I/O	124	MEM_MA_DATA38	I/O
125	MEM_MA_DATA_32	I/O	126	MEM_MA_DATA36	I/O
127	GND	---	128	GND	---
129	MEM_MA_B_DQSQ_N	I/O	130	MEM_MA_DM4	I
131	MEM_MA_B_DQSQ_P	I/O	132	GND	---
133	GND	---	134	MEM_MA_DATA_34	I/O
135	MEM_MA_DATA_33	I/O	136	MEM_MA_DATA_35	I/O
137	MEM_MA_DATA_39	I/O	138	GND	---
139	GND	---	140	MEM_MA_DATA_40	I/O
141	MEM_MA_DATA_44	I/O	142	MEM_MA_DATA_41	I/O
143	MEM_MA_DATA_45	I/O	144	GND	---
145	GND	---	146	MEM_MA_B_DQS5_N	I/O
147	MEM_MA_DM5	I/O	148	MEM_MA_B_DQS5_P	I/O
149	GND	---	150	GND	---
151	MEM_MA_DATA_43	I/O	152	MEM_MA_DATA_42	I/O
153	MEM_MA_DATA_46	I/O	154	MEM_MA_DATA_47	I/O
155	GND	---	156	GND	---
157	MEM_MA_DATA_53	I/O	158	MEM_MA_DATA_49	I/O
159	MEM_MA_DATA_48	I/O	160	MEM_MA_DATA_52	I/O
161	GND	---	162	GND	---
163	NC	---	164	MEM_MA_CLK7_P	I
165	GND	---	166	MEM_MA_CLK7_N	I
167	MEM_MA_DSQ6_N	I/O	168	GND	---
169	MEM_MA_DSQ6_P	I/O	170	MEM_MA_DM6	I
171	GND	---	172	GND	---

173	*MEM_MA_DATA_54*	*I/O*	*174*	*MEM_MA_DATA_50*	*I/O*
175	*MEM_MA_DATA_51*	*I/O*	*176*	*MEM_MA_DATA_55*	*I/O*
177	*GND*	*---*	*178*	*GND*	*---*
179	*MEM_MA_DATA_61*	*I/O*	*180*	*MEM_MA_DATA_58*	*I/O*
181	*MEM_MA_DATA_57*	*I/O*	*182*	*MEM_MA_DATA_60*	*I/O*
183	*GND*	*---*	*184*	*GND*	*---*
185	*MEM_MA_DM7*	*I/O*	*186*	*MEM_MA_DQS7_N*	*I/O*
187	*GND*	*---*	*188*	*MEM_MA_DQS7_P*	*I/O*
189	*MEM_MA_DATA_63*	*I/O*	*190*	*GND*	*---*
191	*MEM_MA_DATA_56*	*I/O*	*192*	*MEM_MA_DATA_59*	*I/O*
193	*GND*	*---*	*194*	*MEM_MA_DATA_62*	*I/O*
195	*PDAT_SMB*	*I/O*	*196*	*GND*	*---*
197	*PCLK_SMB*	*I/O*	*198*	*DIM1_SA0*	*--*
199	*+3V*	*---*	*200*	*DIM1_SA1*	*---*

CN21 DDR Connectors

PI N No.	Signal name	I/O	PIN No.	Signal name	I/O
1	*SMDDR_VREF_DIMM*	*---*	*2*	*GND*	*---*
3	*GND*	*---*	*4*	*MEM_MA_DATA0*	*I/O*
5	*MEM_MA_DATA4*	*I/O*	*6*	*MEM_MA_DATA1*	*I/O*
7	*MEM_MA_DATA5*	*I/O*	*8*	*GND*	*---*
9	*GND*	*---*	*10*	*MEM_MA _DM0*	*I*
11	*MEM_MA_DQS0_N*	*I/O*	*12*	*GND*	*---*
13	*MEM_MA _DQS0_P*	*I/O*	*14*	*MEM_MA_DATA6*	*I/O*
15	*GND*	*---*	*16*	*MEM_MA_DATA7*	*I/O*

17	*MEM_MA_DATA3*	*I/O*	*18*	*GND*	---
19	*MEM_MA_DATA2*	*I/O*	*20*	*MEM_MA_DATA9*	*I/O*
21	*GND*	---	*22*	*MEM_MA_DATA8*	*I/O*
23	*MEM_MA_DATA13*	*I/O*	*24*	*GND*	---
25	*MEM_MA_DATA12*	*I/O*	*26*	*MEM_MA_DM1*	*I*
27	*GND*	---	*28*	*GND*	---
29	*MEM_MA _DQS1_N*	*I/O*	*30*	*MEM_MA _CLK1_P*	*I/O*
31	*MEM_MA _DQS1_P*	*I/O*	*32*	*MEM_MA _CLK1_N*	*I/O*
33	*GND*	---	*34*	*GND*	---
35	*MEM_MA_DATA10*	*I/O*	*36*	*MEM_MA_DATA15*	*I/O*
37	*MEM_MA_DATA11*	*I/O*	*38*	*MEM_MA_DATA14*	*I/O*
39	*GND*	---	*40*	*GND*	---
41	*GND*	---	*42*	*GND*	---
43	*MEM_MA_DATA17*	*I/O*	*44*	*MEM_MA_DATA16*	*I/O*
45	*MEM_MA_DATA20*	*I/O*	*46*	*MEM_MA_DATA21*	*I/O*
47	*GND*	---	*48*	*GND*	---
49	*MEM_MA _DQS2_N*	*I/O*	*50*	*MEMHOT_DIMM#_2*	*O*
51	*MEM_MA _DQS2_P*	*I/O*	*52*	*MEM_MA_DM2*	*I/O*
53	*GND*	---	*54*	*GND*	---
55	*MEM_MA_DATA22*	*I/O*	*56*	*MEM_MA_DATA19*	*I/O*
57	*MEM_MA_DATA23*	*I/O*	*58*	*MEM_MA_DATA18*	*I/O*
59	*GND*	---	*60*	*GND*	---
61	*MEM_MA_DATA29*	*I/O*	*62*	*MEM_MA_DATA28*	*I/O*
63	*MEM_MA_DATA25*	*I/O*	*64*	*MEM_MA_DATA24*	*I/O*
65	*GND*	---	*66*	*GND*	---
67	*MEM_MB_DM3*	*I/O*	*68*	*MEM_MB_DQS3_N*	*I/O*

69	*MEM_MB_RESET#2*	*I/O*	*70*	*MEM_MB_DQS3_P*	*I/O*
71	*GND*	*---*	*72*	*GND*	*---*
73	*MEM_MB_DATA30*	*I/O*	*74*	*MEM_MB_DATA27*	*I/O*
75	*MEM_MB_DATA31*	*I/O*	*76*	*MEM_MB_DATA26*	*I/O*
77	*GND*	*---*	*78*	*GND*	*---*
79	*MEM_MB_CKE0*	*I*	*80*	*MEM_MB_CKE1*	*I*
81	*+1.8VSUS*	*---*	*82*	*+1.8VSUS*	*---*
83	*NC*	*---*	*84*	*MEM_MB_ADD15*	*I*
85	*MEM_MA_BANK2*	*I*	*86*	*MEM_MB_ADD14*	*I*
87	*+1.8VSUS*	*---*	*88*	*+1.8VSUS*	*---*
89	*MEM_MB_ADD12*	*I*	*90*	*MEM_MB_ADD11*	*I*
91	*MEM_MB_ADD9*	*I*	*92*	*MEM_MB_ADD7*	*I*
93	*MEM_MB_ADD8*	*I*	*94*	*MEM_MA_ADD6*	*I*
95	*+1.8VSUS*	*---*	*96*	*+1.8VSUS*	*I*
97	*MEM_MB_ADD5*	*I*	*98*	*MEM_MB_ADD4*	*I*
99	*MEM_MB_ADD3*	*I*	*100*	*MEM_MB_ADD2*	*I*
101	*MEM_MB_ADD1*	*I*	*102*	*MEM_MB_ADD0*	*I*
103	*+1.8VSUS*	*---*	*104*	*+1.8VSUS*	*---*
105	*MEM_MB_ADD10*	*I*	*106*	*MEM_MB_BANK1*	*I*
107	*MEM_MB_BANK0*	*I*	*108*	*MEM_MB_RAS#*	*I*
109	*MEM_MB_WE#*	*I*	*110*	*MEM_MB0_CS#0*	*I*
111	*+1.8VSUS*	*---*	*112*	*+1.8VSUS*	*---*
113	*MEM_MB_CAS#*	*I*	*114*	*MEM_MB0_ODT0*	*I*
115	*MEM_MB0_CS#1*	*I*	*116*	*MEM_MB_ADD13*	*I*
117	*+1.8VSUS*	*---*	*118*	*+1.8VSUS*	*---*
119	*MEM_MB0_ODT1*	*I*	*120*	*NC*	*---*

121	*GND*	*---*	*122*	*GND*	*---*
123	*MEM_MA_DATA38*	*I/O*	*124*	*MEM_MA_DATA35*	*I/O*
125	*MEM_MA_DATA_34*	*I/O*	*126*	*MEM_MA_DATA39*	*I/O*
127	*GND*	*---*	*128*	*GND*	*---*
129	*MEM_MA_B_DQSQ_N*	*I/O*	*130*	*MEM_MA_DM4*	*I*
131	*MEM_MA_B_DQSQ_P*	*I/O*	*132*	*GND*	*---*
133	*GND*	*---*	*134*	*MEM_MA_DATA_36*	*I/O*
135	*MEM_MA_DATA_32*	*I/O*	*136*	*MEM_MA_DATA_37*	*I/O*
137	*MEM_MA_DATA_33*	*I/O*	*138*	*GND*	*---*
139	*GND*	*---*	*140*	*MEM_MA_DATA_45*	*I/O*
141	*MEM_MA_DATA_46*	*I/O*	*142*	*MEM_MA_DATA_44*	*I/O*
143	*MEM_MA_DATA_43*	*I/O*	*144*	*GND*	*---*
145	*GND*	*---*	*146*	*MEM_MA_B_DQS5_N*	*I/O*
147	*MEM_MA_DM5*	*I/O*	*148*	*MEM_MA_B_DQS5_P*	*I/O*
149	*GND*	*---*	*150*	*GND*	*---*
151	*MEM_MA_DATA_42*	*I/O*	*152*	*MEM_MA_DATA_40*	*I/O*
153	*MEM_MA_DATA_41*	*I/O*	*154*	*MEM_MA_DATA_47*	*I/O*
155	*GND*	*---*	*156*	*GND*	*---*
157	*MEM_MA_DATA_53*	*I/O*	*158*	*MEM_MA_DATA_48*	*I/O*
159	*MEM_MA_DATA_52*	*I/O*	*160*	*MEM_MA_DATA_49*	*I/O*
161	*GND*	*---*	*162*	*GND*	*---*
163	*NC*	*---*	*164*	*MEM_MA_CLK7_P*	*I*
165	*GND*	*---*	*166*	*MEM_MA_CLK7_N*	*I*
167	*MEM_MA_DSQ6_N*	*I/O*	*168*	*GND*	*---*
169	*MEM_MA_DSQ6_P*	*I/O*	*170*	*MEM_MA_DM6*	*I*

171	*GND*	---	*172*	*GND*	---
173	*MEM_MA_DATA_54*	*I/O*	*174*	*MEM_MA_DATA_51*	*I/O*
175	*MEM_MA_DATA_55*	*I/O*	*176*	*MEM_MA_DATA_50*	*I/O*
177	*GND*	---	*178*	*GND*	---
179	*MEM_MA_DATA_57*	*I/O*	*180*	*MEM_MA_DATA_56*	*I/O*
181	*MEM_MA_DATA_60*	*I/O*	*182*	*MEM_MA_DATA_61*	*I/O*
183	*GND*	---	*184*	*GND*	---
185	*MEM_MA_DM7*	*I/O*	*186*	*MEM_MA_DQS7_N*	*I/O*
187	*GND*	---	*188*	*MEM_MA_DQS7_P*	*I/O*
189	*MEM_MA_DATA_59*	*I/O*	*190*	*GND*	---
191	*MEM_MA_DATA_63*	*I/O*	*192*	*MEM_MA_DATA_62*	*I/O*
193	*GND*	---	*194*	*MEM_MA_DATA_58*	*I/O*
195	*PDAT_SMB*	*I/O*	*196*	*GND*	---
197	*PCLK_SMB*	*I/O*	*198*	*DIM1_SA0*	--
199	*+3V*	---	*200*	*DIM1_SA1*	---

CN22 MINI PCI-E Card 3G Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	WLAN_WAKE#	O	2	+3V_3G	---
3	NC	---	4	GND	---
5	NC	---	6	+1.5V_3G	---
7	NC	---	8	UIM_PWR	I/O
9	GND	---	10	UIM_DATA	I/O
11	CLK_PCIE_MINI2#	I	12	UIM_CLK	I/O
13	CLK_PCIE_MINI2	I	14	UIM_RST	I/O

15	GND	---	16	UIM_VPP	I
17	NC	---	18	GND	---
19	NC	---	20	3G_EN	I
21	GND	---	22	PLTRST#	I
23	PCIE_RXN3	O	24	+3V_3G	---
25	PCIE_RXP3	O	26	GND	---
27	GND	---	28	+1.5V_3G	---
29	GND	---	30	SB_SCLK2	I/O
31	PCIE_TXN3	I	32	SB_SDATA2	I/O
33	PCIE_TXP3	I	34	GND	---
35	GND	---	36	USBP7-	I/O
37	NC	---	38	USBP7+	I/O
39	+3V_3G	---	40	CPUSB#	---
41	+3V_3G	---	42	3G_LED#	---
43	GND	---	44	NC	---
45	NC	---	46	NC	---
47	NC	---	48	+1.5V_3G	---
49	NC	---	50	GND	---
51	NC	O	52	+3V_3G	---

CN23 MINI PCI-E Card WLAN Connector

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	WLAN_WAKE#	O	2	+3V_WL_VDD	---
3	WCS_DAT	---	4	GND	---
5	WCS_CLK	---	6	+1.5V	---

7	NC	---	8	LAD0	I/O
9	GND	---	10	LAD1	I/O
11	CLK_PCIE_MINI#	I	12	LAD2	I/O
13	CLK_PCIE_MINI	I	14	LAD3	I/O
15	GND	---	16	LFRAME#	I
17	NC	---	18	GND	---
19	NC	---	20	RF_EN	I
21	GND	---	22	PLTRST#	I
23	PCIE_RXN2	O	24	+3V_WL_VAUX	---
25	PCIE_RXP2	O	26	GND	---
27	GND	---	28	+1.5V	---
29	GND	---	30	WL_SMCLK	I/O
31	PCIE_TXN2	I	32	WL_SMDATA	I/O
33	PCIE_TXP2	I	34	GND	---
35	GND	---	36	USBP8-	I/O
37	GND	---	38	USBP8+	I/O
39	+3V_S5	---	40	NC	---
41	+3V_WL_VAUX	---	42	NC	---
43	GND	---	44	NC	---
45	PCLK_DEBUG	---	46	NC	---
47	PCIRST#	---	48	+1.5V	---
49	LDRQ0#_SB	---	50	GND	---
51	SERIRQ	O	52	+3V_WL_VDD	---

Appendix D Display Codes

D.1 Display Codes

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

Table D-1-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
29	\ |	2B	AB	5D	F0	5D	*5
30	Caps Lock	3A	BA	58	F0	58	
31	A	1E	9E	1C	F0	1C	
32	S	1F	9F	1B	F0	1B	
33	D	20	A0	23	F0	23	
34	F	21	A1	2B	F0	2B	
35	G	22	A2	34	F0	34	
36	H	23	A3	33	F0	33	
37	J	24	A4	3B	F0	3B	*2
38	K	25	A5	42	F0	42	*2
39	L	26	A6	4B	F0	4B	*2
40	; :	27	A7	4C	F0	4C	*2
41	‘ “	28	A8	52	F0	52	
43	Enter	1C	9C	5A	F0	5A	*3
44	Shift (L)	2A	AA	12	F0	12	
45	No.102 key	56	D6	61	F0	61	
46	Z	2C	AC	1A	F0	1A	
47	X	2D	AD	22	F0	22	
48	C	2E	AE	21	F0	21	
49	V	2F	AF	2A	F0	2A	
50	B	30	B0	32	F0	32	
51	N	31	B1	31	F0	31	
52	M	32	B2	3A	F0	3A	*2
53	, <	33	B3	41	F0	41	*2
54	. >	34	B4	49	F0	49	*2
55	/ ?	35	B5	4A	F0	4A	*2
57	Shift (R)	36	B6	59	F0	59	

Table D-1-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
58	Ctrl	1D	9D	14	F0 14	*3
60	Alt (L)	38	B8	11	F0 11	*3
61	Space	39	B9	29	F0 29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0 11	
75	Ins	E0 52	E0 D2	E0 70	E0 F0 70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0 71	*1
79	←	E0 4B	E0 CB	E0 6B	E0 F0 6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0 6C	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0 69	*1
83	↑	E0 48	E0 C8	E0 75	E0 F0 75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0 72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0 7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0 7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0 74	*1
110	Esc	01	81	76	F0 76	
112	F1	3B	BB	05	F0 05	
113	F2	3C	BC	06	F0 06	
114	F3	3D	BD	04	F0 04	
115	F4	3E	BE	0C	F0 0C	
116	F5	3F	BF	03	F0 03	
117	F6	40	C0	0B	F0 0B	
118	F7	41	C1	83	F0 83	
119	F8	42	C2	0A	F0 0A	
120	F9	43	C3	01	F0 01	
121	F10	44	C4	09	F0 09	*3

Table D-1-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
122	F11	57	D7	78	F0 78	*3
123	F12	58	D8	07	F0 07	*3
124	PrintSc	*6	*6	*6	*6	*6
126	Pause	*7	*7	*7	*7	*7
202	Fn	—	—	—	—	*4
203	Win	E0 5B	E0 DB	E0 1F	E0 F0 1F	
204	App	E0 5D	E0 DD	E0 2F	E0 F0 2F	

Table D-1-1 Scan codes (set 1 and set 2) (4/4)

Notes:

1. * Scan codes differ by mode.
2. * Scan codes differ by overlay function.
3. * Combined with the **Fn** key makes different codes.
4. * **Fn** key does not generate a code by itself.
5. * This key corresponds to key No. 42 in a 102-key model.
6. * Refer to Table D-6, No. 124 key scan code.
7. * Refer to Table D-7, No. 126 key scan code.

Cap No.	Key top	Code set 1								Code set 2									
		Make				Break				Make					Break				
55	/	E0	AA	E0	35	E0	B5	E0	2A	E0	F0	12	E0	4A	E0	F0	4A	E0	12
75	INS	E0	AA	E0	52	E0	D2	E0	2A	E0	F0	12	E0	70	E0	F0	70	E0	12
76	DEL	E0	AA	E0	53	E0	D3	E0	2A	E0	F0	12	E0	71	E0	F0	71	E0	12
79	←	E0	AA	E0	4B	E0	CB	E0	2A	E0	F0	12	E0	6B	E0	F0	6B	E0	12
80	Home	E0	AA	E0	47	E0	C7	E0	2A	E0	F0	12	E0	6C	E0	F0	6C	E0	12
81	End	E0	AA	E0	4F	E0	CF	E0	2A	E0	F0	12	E0	69	E0	F0	69	E0	12
83	↑	E0	AA	E0	48	E0	C8	E0	2A	E0	F0	12	E0	75	E0	F0	75	E0	12
84	↓	E0	AA	E0	50	E0	D0	E0	2A	E0	F0	12	E0	72	E0	F0	72	E0	12
85	PgUp	E0	AA	E0	49	E0	C9	E0	2A	E0	F0	12	E0	7D	E0	F0	7D	E0	12
86	PgDn	E0	AA	E0	51	E0	D1	E0	2A	E0	F0	12	E0	7A	E0	F0	7A	E0	12
89	→	E0	AA	E0	4D	E0	CD	E0	2A	E0	F0	12	E0	74	E0	F0	74	E0	12
203	Win	E0	AA	E0	5B	E0	DB	E0	2A	E0	F0	12	E0	1F	E0	F0	1F	E0	12
204	App	E0	AA	E0	5D	E0	DD	E0	2A	E0	F0	12	E0	2F	E0	F0	2F	E0	12

Table D-1-2 Scan codes with left Shift key

Note: The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left **Shift**	With right **Shift**
Set 1	E0 AA ___________	E0 B6
	E0 2A ____________	E0 36
Set 2	E0 F0 12 _________	E0 F0 59
	E0 12 ____________	E0 59

Cap No.	Key top	Code set 1								Code set 2									
		Make				Break				Make				Break					
75	INS	E0	2A	E0	52	E0	D2	E0	AA	E0	12	E0	70	E0	F0	70	E0	F0	12
76	DEL	E0	2A	E0	53	E0	D3	E0	AA	E0	12	E0	71	E0	F0	71	E0	F0	12
79	←	E0	2A	E0	4B	E0	CB	E0	AA	E0	12	E0	6B	E0	F0	6B	E0	F0	12
80	Home	E0	2A	E0	47	E0	C7	E0	AA	E0	12	E0	6C	E0	F0	6C	E0	F0	12
81	End	E0	2A	E0	4F	E0	CF	E0	AA	E0	12	E0	69	E0	F0	69	E0	F0	12
83	↑	E0	2A	E0	48	E0	C8	E0	AA	E0	12	E0	75	E0	F0	75	E0	F0	12
84	↓	E0	2A	E0	50	E0	D0	E0	AA	E0	12	E0	72	E0	F0	72	E0	F0	12
85	PgUp	E0	2A	E0	49	E0	C9	E0	AA	E0	12	E0	7D	E0	F0	7D	E0	F0	12
86	PgDn	E0	2A	E0	51	E0	D1	E0	AA	E0	12	E0	7A	E0	F0	7A	E0	F0	12
89	→	E0	2A	E0	4D	E0	CD	E0	AA	E0	12	E0	74	E0	F0	74	E0	F0	12
203	Win	E0	2A	E0	5B	E0	DB	E0	AA	E0	12	E0	1F	E0	F0	1F	E0	F0	12
204	App	E0	2A	E0	5D	E0	DD	E0	AA	E0	12	E0	2F	E0	F0	2F	E0	F0	12

Table D-1-3 Scan codes in Numlock mode

Cap No.	Keytop	Code set 1				Code set 2				
		Make		Break		Make		Break		
43	ENT	E0	1C	E0	9C	E0	5A	E0	F0	5A
58	CTRL	E0	1D	E0	9D	E0	14	E0	F0	14
60	LALT	E0	38	E0	B8	E0	11	E0	F0	11
121	ARROW	45		C5		77		F0	77	
122	NUMERIC	45		C5		77		F0	77	
123	Scrl	46		C5		7E		F0	7E	

Table D-1-4 Scan codes with Fn key

Cap No.	Keytop		Code set 1		Code set 2	
			Make	Break	Make	Break
09	8	(8)	48	C8	75	F0 75
10	9	(9)	49	C9	7D	F0 7D
11	0	(*)	37	B7	7C	F0 7C
23	U	(4)	4B	CB	6B	F0 6B
24	I	(5)	4C	CC	73	F0 73
25	O	(6)	4D	CD	74	F0 74
26	P	(–)	4A	CA	7B	F0 7B
37	J	(1)	4F	CF	69	F0 69
38	K	(2)	50	D0	72	F0 72
39	L	(3)	51	D1	7A	F0 7A
40	;	(+)	4E	CE	79	F0 79
52	M	(0)	52	D2	70	F0 70
54	.	(.)	53	D3	71	F0 71
55	/	(/)	E0 35	E0 B5	40 4A	E0 F0 4A

Table D-1-5 Scan codes in overlay mode

Key top	Shift	Code set 1		Code set 2	
		Make	Break	Make	Break
Prt Sc	Common	E0 2A E0 37	E0 B7 E0 AA	E0 12 E0 7C	E0 F0 7C E0 F0 12
	Ctrl +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Shift +	E0 37	E0 B7	E0 7C	E0 F0 7C
	Alt +	54	D4	84	F0 B4

Table D-1-6 No.124 key scan code

Key top	Shift	Code set 1	Code set 2
		Make	Make
Pause	Common*	E1 1D 45 E1 9D C5	E1 14 77 E1 F0 14 F0 77
	Ctrl*	E0 46 E0 C6	E0 7E E0 F0 7E

Table D-1-7 No.126 key scan code

**: This key generates only make codes.*

Appendix E Keyboard Layout

1. United Status (US) Keyboard

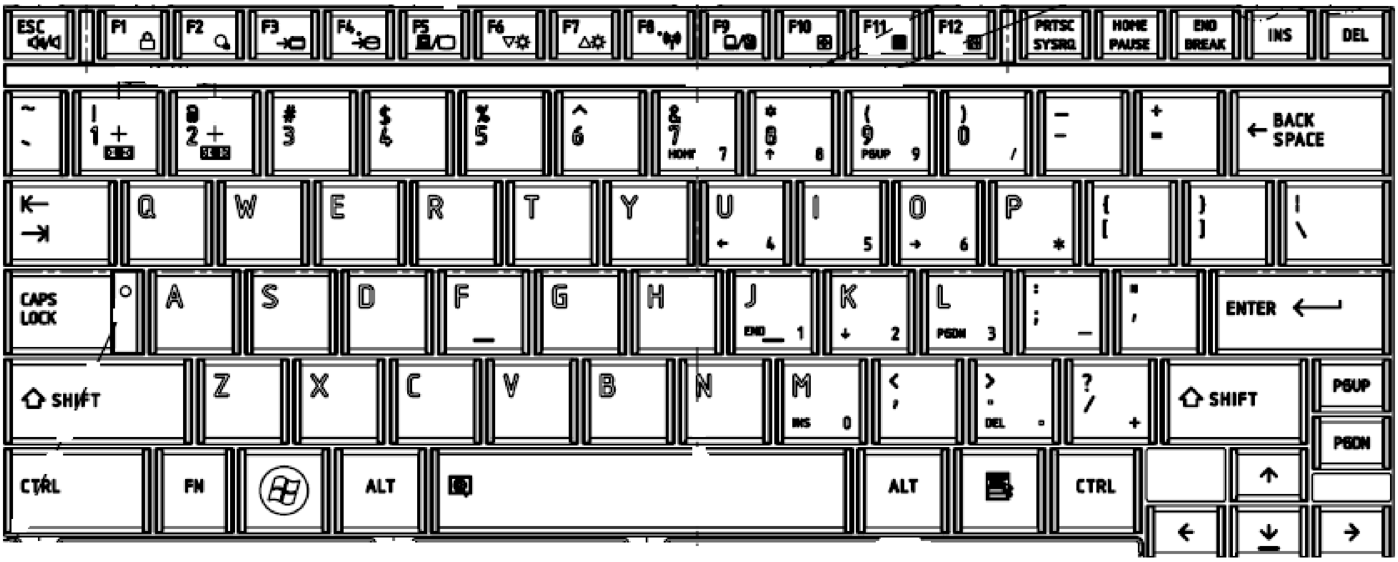


Figure E-1-1 US keyboard

2. United Kingdom (UK) Keyboard

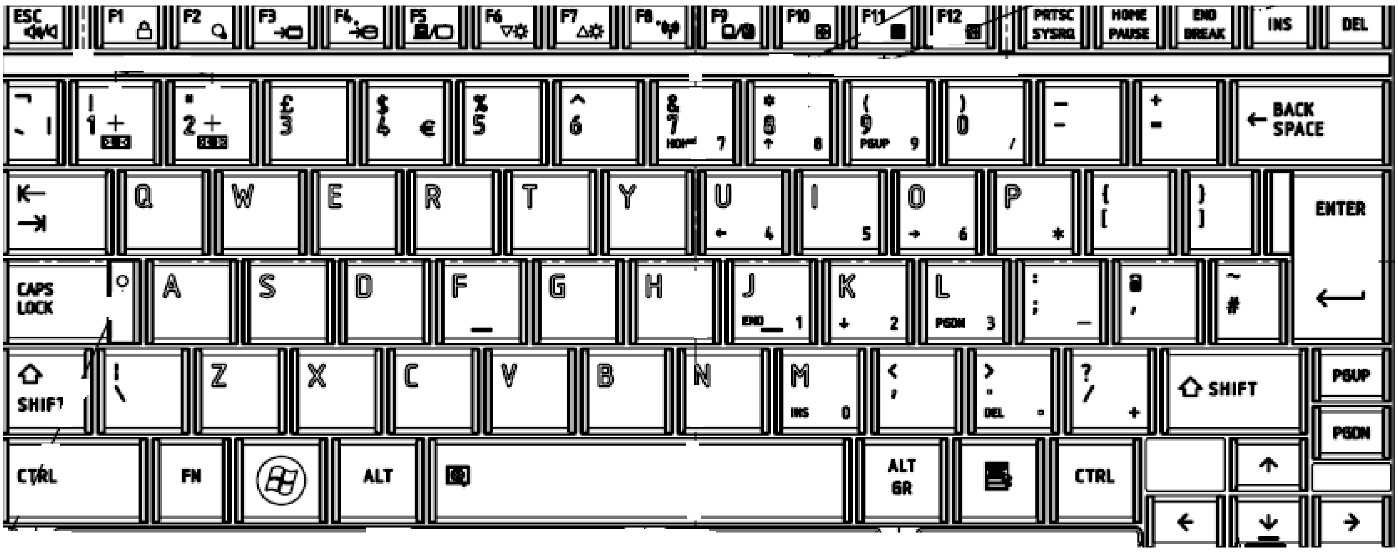


Figure E-2-1 UK keyboard

3. Japan Keyboard

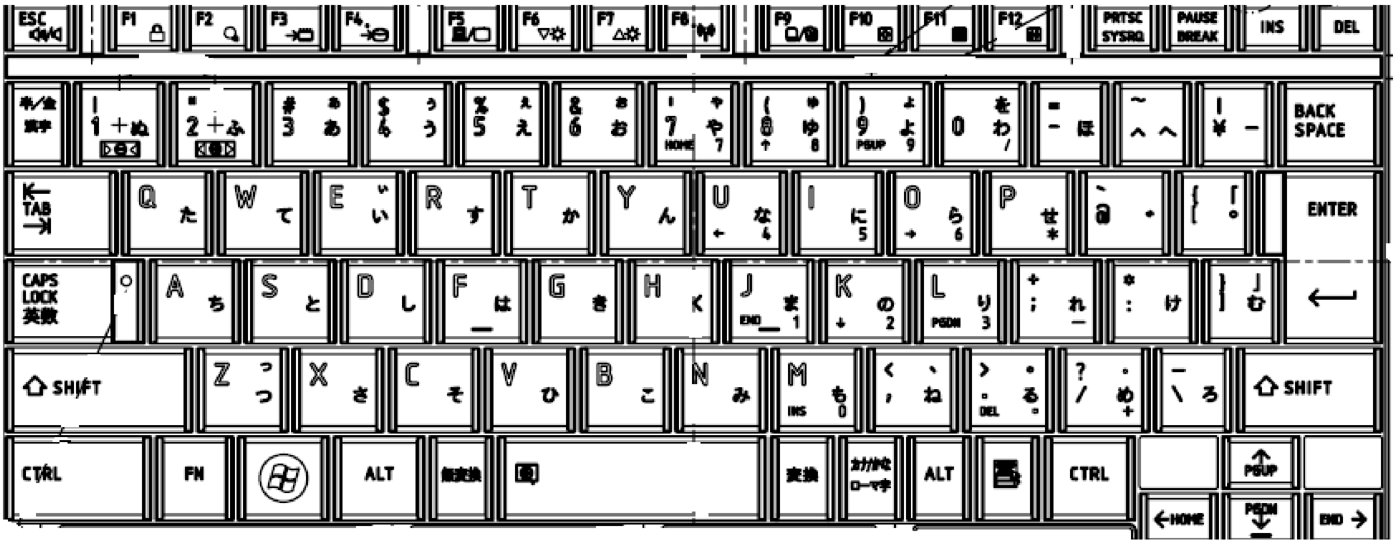


Figure E-3-1 Japan keyboard

Appendix F Wiring Diagrams

F.1 RGB Monitor ID Wraparound connector

(1) +5V	+5V (1)
(2) +3V	+3V (2)
(3) NC	NC (3)
(4) NC	NC (4)
(5) GND	GND (5)
(6) DDCDAT	DDCDAT (6)
(7) VSYNC	VSYNC (7)
(8) DDCCLK	DDCCLK (8)
(9) HSYNC	HSYNC (9)
(10) GND	GND (10)
(11) GND	GND (11)
(12) CRT_R	CRT_R (12)
(13) CRT_G	CRT_G (13)
(14) GND	GND (14)
(15) GND	GND (15)
(16) CRT_B	CRT_B (16)

Figure F-1-1 RGB Monitor ID Wraparound connector (16PIN to 16PIN)

F.2 LAN Loop back Connector

(1) BIBAP ‘(TX+)	(3) BIDBP (RX+)
(2) BIDAN (TX-)	(4) BIDBN (RX-)

Figure F-2-1 LAN loopback connector